HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES

A THESIS SUBMITTED TO BABA FARID UNIVERSITY OF

HEALTH SCIENCES, FARIDKOT (PUNJAB)

IN THE PARTIAL FULFILLMENT

FOR THE AWARD OF DEGREE OF

DOCTOR OF MEDICINE

IN

PATHOLOGY

2024

Submitted By

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I hereby declare that the thesis entitled **"HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES"** submitted towards partial fulfillment of the requirements for the award of MD IN **PATHOLOGY** degree to BFUHS is a compilation of original work carried out by me under the supervision of **Dr. Harpreet Kaur,** Professor & Head, Department of Pathology, **Dr. Aminder Singh**, Associate Professor, Department of Pathology and **Dr. Sandeep Sharma**, Professor & Head, Department of Urology. No part of this thesis has formed the basis for the award of any degree previously.

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Dedicated

to

my Family

&

Teachers

ACKNOWLEDGEMENT

At the very outset of this report, I would like to add a few words of appreciation for the people who have been a part of this project right from its inception. The writing of this thesis has been one of the significant academic challenges I have faced and without the support, patience and guidance of the people involved, this task would not have been completed. I owe my deepest gratitude to them.

First and foremost, praises and thanks to the god, almighty, for his blessings throughout my research work.

I am ineffably indebted to my guide and mentor, ***Dr. Harpreet Kaur,*** *Professor and Head, Department of Pathology,* ***Dayanand Medical College and Hospital, Ludhiana*** *for her conscientious guidance and encouragement to accomplish my research work. Her wisdom, knowledge and commitment to the highest standards inspired and motivated me.*

No words can express the amount of admiration, respect & gratitude I have for my co-guide, ***Dr. Aminder Singh,*** *Associate Professor, Department of Pathology,* ***Dayanand Medical College and Hospital, ludhiana*** *who has been a constant source of inspiration for me throughout .I am deeply in debted for his support in building up the concepts, constant encouragement, kind patronage & meticulous care in correcting every topic that has been described in my study. Words fail to express by profound gratitude*

to my esteemed teacher and co-supervisor, ***Dr. Sandeep Sharma.*** *With great regard and due decorum i acknowledge my sincere thanks to* ***Dr. Bhavna Garg*** *, professor ,* ***Dayanand Medical College and Hospital, ludhiana****, for her invaluable advice and guidance throughout the course of the study .i have great pleasure in expressing my sincere thanks to* ***Dr. Pavneet Kaur*** *,professor ,department of pathology ,****Dayanand Medical College and Hospital, ludhiana****, for her constant encouragement throughout the study. i owe a debt of gratitude to my respected teachers* ***Dr. Vikram Narang, Dr. Sumit Grover ,Dr. Ruchita Tyagi Grover and Dr. Saloni Goyal*** *for guiding and encouraging me throughout the period of study. i take this opportunity to thank my dearest husband* ***Dr. Vasul Jain*** *for truly believing in me and giving me constant reassurance throughout .i am grateful to my brother* ***Lohit Sharma,*** *for giving me joy and happiness in my bad times and cheering me throughout.*

"Behind every daughter who believes in herself, are the parents who believed first" With this saying, I am eternally indebted to my grandparents ***Mr. ML Sharma*** *and* ***Mrs. Raksha Sharma, Late Mr. KD Sharma, Mrs. Raksha Rani and Mr. Parduman Kumar Jain,*** *my parents* ***Mr.Sudhir Sharma*** *and* ***Dr. Mrs Neelam Sharma, Dr. Narinder Jain and Mrs. Manju Jain*** *for their valuable support that I have received throughout my life and for believing in me. I place all the credit of my success and achievements in their holy feet. They are the ultimate role models for me. I thank almighty for giving me the best parents in the world .I take this opportunity to*

thank my batch mates and now my good friends ***Dr. Priyanka, Dr. Purnima and Dr. Supreet*** *and I would also love to thanks my seniors* ***Dr. Mehar, Dr. Devika, Dr. Parul, Dr. Ramneek*** *and* ***Dr. Nishav.*** *I would also like to thank my juniors* ***Dr.Pavel ,Dr.Siddarth,Dr.Purvi,Dr.Simmi, Dr.Gursimran, Dr. Samriti, Dr. Anandita, Dr. Sumer, Dr. Shubhangi*** *and* ***Dr. Shubham.*** *I would also like to thank who helped me in compiling my thesis, the timely completion of which would never have been possible without their honest opinions and criticisms.*

Dr. Pragya Sharma

LIST OF ABBREVIATIONS

IHC	Immunohistochemistry
WHO	World Health Organization
TURBT	Transurethral resection of bladder tumours
p63	Transformationrelatedprotein63
SMA	Smooth Muscle Actin
GATA-3	GATA binding protein 3
PUNLMP	Papillary urothelial neoplasm of low malignant potential
SCC	Squamous cell carcinoma
HPV	Human Papilloma virus

ABSTRACT

Introduction- Urinary bladder cancer is the 9th most frequent cancer in the world and accounts for significant morbidity and mortality. It presents both clinical and biologic difficulties. There is a wide age dispersion with median age of 65-70 years at diagnosis. It is important to diagnose these cases at an early stage. Once bladder carcinoma metastasizes treatment options are limited.

Aims and objectives- 1. To study the histomorphological spectrum of urinary bladder biopsies

2. To correlate the morphology with IHC findings whenever possible.

Material and methods- Study was conducted in DMCH, Ludhiana from 15th September2022 to 14th March 2024, for 1.5 years. All urinary bladder biopsies and cystectomy specimens received in the department of Pathology were included in the study. A total of 26,012 specimens were received during this study period, out of which 132 were urinary bladder biopsies constituting 0.5% of all specimens.

Results- Of the 132 cases, 85.6% were neoplastic lesions followed by 14.4% non-neoplastic lesions. Among the neoplastic lesions, most common lesion was non-invasive urothelial carcinoma followed by infiltrating urothelial carcinoma. Of the non-invasive urothelial lesions, most common was non-invasive papillary urothelial carcinoma, low grade.Mean age of the patients was 61.3 years.

Conclusion- Majority of urinary bladder biopsies received were neoplastic lesions.

Key words- Urinary bladder cancer, non-invasive urothelial carcinoma, infiltrating urothelial carcinoma

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INTRODUCTION

The ninth most frequent cancer in the world, urinary bladder carcinomas cause a considerable amount of morbidity and death. It ranks seventh among malignancies in males and seventeenth in women.[1]Urinary bladder neoplasms present clinical and biologic difficulties. Urinary bladder tumours continue to have a detrimental impact on morbidity and mortality even with advances in diagnosis and treatment. [2] Pathologists and urologists face many problems in the areas of biologics, clinical diagnosis, therapy, and diagnosis since bladder tumours are a heterogeneous group with varying subtypes and behavioural characteristics.[3] Men are three to four times as likely than women to have bladder cancer. There is a wide age dispersion with a median age of 65–70 years at diagnosis. Males are more likely than females to get bladder cancer, which can be explained by variations in risk factors including smoking and exposure to certain substances at work. Additionally, there is a difference in mortality between the sexes: 2–10 deaths for every 100,000 males and 0.5–4 deaths for every 100,000 females annually. The frequency of bladder cancers is almost six times higher in developed nations than in underdeveloped ones. The incidence, morbidity, and mortality rates of bladder cancer range significantly throughout nations and ethnic groups. Although the prevalence of bladder cancer is twice as high in White Americans as in African Americans, African Americans appear to have a lower overall survival rate. [4]

Urinary bladder lesions can be divided into non-neoplastic and neoplastic conditions. The non-neoplastic conditions include interstitial cystitis, eosinophilic cystitis, emphysematous cystitis, tuberculosis and bacillus Calmette Guerin induced granulomas, malakoplakia, haemorrhagic cystitis, giant cell cystitis, follicular cystitis and cystitis secondary to ketamine administration. Metaplastic and tumour like conditions include intestinal metaplasia, nephrogenic metaplasia, fibroepithelial polyps and pseudocarcinomatous proliferation. Neoplastic conditions include papillary neoplasm of low malignant

potential, non-invasive papillary urothelial carcinoma, low grade and non-invasive papillary urothelial carcinoma, high grade, infiltrating urothelial carcinoma, squamous cell carcinoma, adenocarcinoma, small cell and large cell neuroendocrine carcinoma, leiomyoma, leiomyosarcoma, lymphoma, solitary fibrous tumor, paraganglioma etc.

The distinction between these lesions is crucial due to variations in patient care and clinical results.[5] The main diagnostic method is cystoscopy, which is helpful in locating bladder cancers and taking biopsies of any suspected lesions.[6]According to the 2016 WHO classification, urothelial neoplasms can have numerous morphologic variations, a diversified genome, and divergent differentiation, all of which can be used to help choose a treatment.[7] In all situations when there are clinico-radiological signs such as diffuse thickening of bladder wall or bladder tumour, a biopsy is the initial line of study. Numerous viral and inflammatory illnesses can mimic cancerous situations. At the time of diagnosis, 70–80% of patients with newly discovered bladder cancer had either non-invasive or early invasive disease (stage Ta, Tis, or T1).Recurrence is typical with these tumours, but only 15–25% of them advance.[4]

People with non-muscle invasive urothelial neoplasms need to be followed up on and given care continuously. Treatment options for muscle-invasive bladder cancer include radiation therapy combined with adjuvant and/or neoadjuvant chemotherapy, radical cystectomy, or cystoprostatectomy.

Once bladder carcinoma metastasizes treatment options are limited. Most metastatic tumors respond poorly to chemotherapy which produces 5-year survival rates of only 15%. So, we must closely monitor for lamina propria or muscularis propria invasion because this will determine the outcome of the entire course of treatment.

AIMS AND OBJECTIVES

1. To study the histomorphological spectrum of urinary bladder biopsies
2. To correlate the morphology with IHC findings whenever possible.

REVIEW OF LITERATURE

Urinary and genital systems are closely related in relation to development, topography, and function. The kidneys, ureters, urinary bladder and urethra make up the urinary system.

The development of the urogenital system is significantly influenced by two embryonic features. They are the cloaca and the intermediate mesoderm. Three components make up intraembryonic mesoderm: paraxial mesoderm, lateral plate mesoderm, and intermediate mesoderm.

Before the head fold, the intermediate mesoderm is situated between the paraxial and lateral plate mesoderm. After the embryonic disc folds and the peritoneal cavity is formed, the intermediate mesoderm bulges the posterior abdominal wall. It is called the urogenital ridge and is further divided into the genital ridge, which forms the genital system, and the nephrogenic cord, which is the lateral component and forms the urine system. The embryo's nephrogenic cord runs from its cervical to its sacral regions. Numerous significant structures are produced in relation to the nephrogenic cord on each side at different developmental stages. Cloaca refers to the region of the hindgut caudal to allantois. The dorsal primitive rectum and ventral primitive urogenital sinus are separated by the urorectal septum. The cranial portion of the primitive urogenital sinus is known as the vesicourethral canal, while the caudal portion is known as the definitive urogenital sinus. The vesicourethral canal is the portion of the primordial urogenital sinus that is situated above the mesonephric duct apertures. Its lower section is narrower while its upper part is wider. This dilated portion of the vesicourethral canal, which includes the proximal section of the allantois, gives origin to the urinary bladder. The primitive urethra develops from the bottom, thin segment of the vesicourethral canal. The bladder's trigone forms when the ureteric buds and mesonephric ducts are absorbed into the vesicourethral canal's posterior wall. The origin of the trigone is mesodermal. The bladder's epithelium is formed by cranial endoderm of vesicourethral canal. Mesonephric duct

absorption produces the bladder's trigone's epithelium (mesoderm). After birth, the allantois atrophies and appears as the urachus, or median umbilical ligament, that runs from the bladder's apex to the umbilicus.[8]

The urinary bladder is a hollow viscus that, when enlarged, resembles a spherical structure and, when empty, takes the shape of an inverted pyramid with four sides. It has two inferolateral surfaces, one posterior surface or base, and superior surface called the dome[9]. The base of the bladder, where the posterior and inferolateral walls merge to open into the urethra, is where Trigone is situated. The bladder's lymphatic drainage occurs via the internal and external iliac nodes. The lining epithelium, lamina propria, muscularis propria, and adventitia are the layers that make up the bladder. At the dome, serosa covers the adventitia. Continuous or discontinuous muscularis mucosae is frequently seen in the mucosa. Even though "urothelium" is a more accurate and practical term, "transitional" has historically been used to characterize the bladder's epithelium. It is usually six to seven cells thick in a confined bladder and only two or three cells thick in a dilated bladder. The three layers of the urothelium are superficial, intermediate, and basal. The superficial layer is composed of umbrella cells, which are a single row of big cells with an abundance of eosinophilic cytoplasm. Large, multilobated nuclei and noticeable cytoplasmic vacuolization are features of umbrella cells. The intermediate cells feature oval nuclei with fine chromatin, a medium to low columnar form, many nuclear grooves, and a moderate amount of cytoplasm. A row of cuboidal cells that form the basal layer are arranged on a thin, continuous basal lamina. The lamina propria is made up of loose connective tissue that has a sparse distribution of elastic fibers, lymphatics, and a rich vascular network. Additionally, smooth muscle cells can be seen in the muscularis mucosae. These cells are typically found as isolated bundles, a discontinuous thin layer, or very infrequently, a continuous layer.[10]When determining the level

of invasion of a bladder carcinoma, these can be confused with the muscle bundles of the muscularis propria since the presence or absence of this invasion is crucial for tumour staging and treatment. Muscularis propria shows a strong and diffuse reaction to smoothelin immunostaining, a novel smooth muscle-specific marker that is expressed only in fully differentiated smooth muscle cells. In contrast, muscularis mucosae either shows no staining at all or a weak and focal staining [11].

Congenital abnormalities of urinary bladder include urachal lesions and exstrophy. The involution of the cloaca and allantoic duct leads in the vestige structure known as the urachus, which is situated between the bladder and umbilicus.[12].During development, it connects the bladder to the allantois. Before birth, the urachus retracts from the bladder and regresses into the fibrous cord known as the median umbilical ligament. It could continue to run parallel to the bladder wall and cavity. The lining may be transitional or columnar. Anomalies include intravesical polypoid multicystic masses (also known as "hamartomas"), abscesses, granulomatous omphalitis, blind sinuses in the anterior abdominal wall, and patent urachus, through which urine may enter[13]. This structure can also give rise to cancers, the most frequent of which is adenocarcinoma. These are mainly well-differentiated tumours that produce mucin, though enteric type and signet ring carcinomas can also arise [14]. Villous adenoma, small cell carcinoma, squamous cell carcinoma, and transitional cell (urothelial) carcinoma are some more forms of tumours [15]. The placement of the tumour prevents early symptoms and a prompt diagnosis, which is the main cause of the poor overall prognosis. Treatment options include en bloc radical cystoprostatectomy/ umbilectomy or umbilectomy with partial cystectomy, depending on the severity of the condition. [16].

A congenital defect known as exstrophy is characterized by eversion of the posterior bladder wall and lack of the anterior vesicle and lower abdominal wall. [17]The tumour type in most has usually been adenocarcinoma occasionally admixed with squamous

elements.[18]Depending on the particulars of the deformity, bladder exstrophy treatment may involve closing or reapproximating the defect in addition to correcting the other abnormalities that frequently coexist with this illness.[19]

Cystitis

Interstitial Cystitis (Painful Bladder Syndrome) -The classic clinical picture of interstitial (Hunner) cystitis is an adult or older female who is refractory to medical therapy and has ulceration and severe submucosal edema of the bladder, resulting in prominent lower abdominal, suprapubic, or perineal pain and frequent urination.[20] Because of presence of ulceration, this disease is known as Hunner ulcer. Microscopic examination shows mucosal ulceration with fibrin and necrotic materials. There is edema, bleeding, granulation tissue, and a mononuclear inflammatory infiltrate with a mostly perineural location in the underlying lamina propria and muscularis.[21]

Women and children can develop eosinophilic cystitis, which is frequently linked to eosinophilia and allergy problems.[22] Exceptionally, the disease is due to parasitic infestation.[23] Clinically, dramatic and recurring episodes of dysuria and hematuria are the hallmark of the allergy related variant of eosinophilic cystitis.[24] On cystoscopy examination, mucosa appears diffusely edematous and erythematous, with broad-based polypoid growths that resemble tumours.[25] Microscopically, there is a dense inflammatory infiltration that is rich in eosinophils, along with fibrosis, muscle necrosis, and occasionally large cells.[26]

Emphysematous cystitis is an inflammatory disease marked by the formation of gas-filled vesicles and brought on by gas-forming bacteria like Clostridium perfringens. [27] Individuals who have neurogenic bladder, diabetes, malignant hematologic disorders, and persistent urine infections are at a higher risk of developing the disease. [28] Multinucleated large cells are seen partially lining the cysts microscopically. [29]

Tuberculosis and Bacillus Calmette–Guérin Induced Granulomas- The most frequent cause of granulomatous inflammation in much of the world is tuberculosis. The trigone region, particularly the area surrounding the ureteral orifices, is home to the majority of bladder lesions. Early lesions are tiny and superficial, with a soft caseous material floor and a hyperemic zone around them. Multiple ulcers merge to form larger ones as the disease worsens, involving the underlying musculature and causing fibrosis. When Bacillus Calmette-Guérin (BCG) is administered intravenously to treat superficial bladder cancer, it can cause granulomatous inflammation of the organ, which can be seen under a microscope or by examining bladder wash specimens cytologically. [30]

Multiple nodular thickenings of the mucosa and underlying stroma, generally in the trigone region, are a characteristic of bladder malakoplakia that can be misinterpreted for cancer. [31] Under the surface epithelium, groups of histiocytes with granular eosinophilic cytoplasm accumulate under the microscope. Some of these cells have round, concentrically layered intracytoplasmic inclusions known as Michaelis-Gutmann bodies. These bodies are basophilic and stain for calcium and ironand are periodic acid-Schiff (PAS) positive. Although it does not have Michaelis-Gutmann bodies, xanthogranulomatous cystitis resembles malakoplakia pathogenetically and morphologically. [32]

Metaplastic and tumour like conditions of urinary bladder

Intestinal metaplasia and cystitis glandularis, which are frequently associated with ureteral reimplantation, neurogenic bladder, and bladder exstrophy, arise from long-term inflammation or other sources of mucosal irritation. [33] Cystoscopically, they typically appear as irregular lesions that could be mistaken for cancer. Most commonly affected is the trigone. Microscopically, the initial change is focal proliferation of basal layer of urothelium, which results in buds that eventually form into nodules (von Brunn nests or islands) within the

lamina propria. A central cystic area develops in some of these nodules. The condition is called cystitis cystica when the cells lining the cyst retain their urothelial appearance, and cystitis glandularis when the luminal cells acquire luminal oriented cytoplasm that gives the cyst a glandular appearance. These metaplastic alterations can resemble urothelial carcinoma when they are extremely florid, especially the nested form.[34]

Nephrogenic adenoma (nephrogenic metaplasia) has been regarded to as a benign neoplasm and designated as nephrogenic adenoma, but most authors believe that it denotes a localized or widespread metaplastic alteration of the urothelium brought on by a protracted catheterization, calculi, or persistent infection. [35] These lesions can be sessile, polypoid, or papillary in gross anatomy. Their microscopic appearance is heterogeneous with numerous architectural patterns that are often admixed including small tubular, papillary, sheet-like with clear cytoplasm (diffuse), fibromyxoid, and flat.[36] Differential diagnosis are clear adenocarcinoma and signet ring adenocarcinoma.

Polypoid cystitis is a benign process of reactive nature which may simulate a neoplasm grossly. Usually, the posterior wall above the trigone is the affected area. Gross variants of this condition include bullous cystitis, in which the elevations are broad and rounded, and papillary cystitis, in which they are thin and filiform. [37]

Postoperative granulomas can develop following catheterization and diathermy. Because of the central necrosis surrounded by palisading of histiocytes and dispersed large cells, the microscopic appearance may resemble a foreign body granuloma or a rheumatoid nodule. [38] Fibrous scars form to repair these lesions.

Prostatic-type polyps similar to those occurring in the prostatic part of urethra have been seen in the bladder neck, around the ureteral orifices, and at the dome. [39]

Fibroepithelial polyps mostly affect small children. Most are located near the verumontanum or bladder neck. Microscopically, there is lining

by normal urothelium. In contrast to the noticeable edema and inflammation shown in polypoid cystitis, the stroma is fibrous. [(40)] The botryoid type of embryonal rhabdomyosarcoma is the most significant differential diagnosis.[41]

Radiation treatment can result in pseudocarcinomatous growth, either with or without accompanying ulceration.[42]Vascular ectasia and atypical fibroblasts in the stroma represent important diagnostic clues.[43]

Urothelial carcinoma

Etiology

Genetics-Based on available data, there are two biological pathways by which urothelial tumours might develop and become muscle-invasive cancers: either high-grade papillary tumours or urothelial CIS lesions. The most common losses in infiltrative bladder tumours involve the tumour suppressor genes FHIT (3q14), CDKN2A (9q21), PTCH, DBC1, TSC1 (9q22-34), PTEN (10q23), RB1 (13q14), and TP53 (17p13). Activating mutations in FGFR3 and deactivating alterations of TP53 are the most commonly observed mutations, together with TERT gene mutations.

Inherited cancer syndromes-A mutation in a DNA mismatch repair gene result in Lynch syndrome, an autosomal dominant illness. Patients are predisposed to extracolonic tumours including tumours at endometrial, small bowel, stomach, ovarian, hepatobiliary, brain, skin and urinary tract sites. Although there is a higher incidence of upper tract urothelial neoplasms, new study reveals that there may also be a higher risk of bladder urothelial neoplasia.[44]

Environmental factors have an important role in upper and lower urinary tract carcinogenesis and include exposure to a wide variety of chemical compounds. Smoking, particularly cigarette smoking, is a risk factor for urinary bladder carcinoma of the lower and upper urinary

tract. [45]The length and intensity of smoking are linked to the risk of bladder cancer, and stopping smoking over time progressively lowers that risk. The effects of cigarette smoking are linked to multiple chemical agents, particularly aromatic amines which are metabolized in the body, triggering carcinogenesis through the formation of DNA adducts.[46]

Occupational exposure- Exposure to aromatic amines among truck, taxi, and bus drivers (e.g. in diesel exhaust), painters (in paint products) and workers in some chemical industries is associated with increased risk of bladder cancer, an effect synergized by smoking.[47]

Arsenic- The presence of arsenic in drinking water and soil is a concern factor for the environment in some areas of Bangladesh, India, China, and Hungary. Bladder cancer has been found to be strongly related with arsenic concentrations above 300 µg/L. [48] Among smokers, lower concentrations of arsenic also conferred an increased bladder cancer risk, indicating a synergistic carcinogenic effect.[49]

Phenacetin- Long-term use of phenacetin is strongly associated with urothelial carcinoma, but the incidence of these carcinomas is subsiding, as phenacetin is replaced by other analgesics.[50]

Radiotherapy-The mutagenic effects of pelvic radiation including external beam radiotherapy for prostate, uterine and cervix carcinoma and brachytherapy for prostate cancer, are associated with an increased risk of urinary bladder tumours. [51]

Schistosoma infection-It is recognized that urothelial carcinoma, squamous cell carcinoma, and adenocarcinoma, is caused by persistent, chronic inflammation of urinary bladder. Schistosoma haematobium infection is the most common cause for this category of bladder carcinogenesis. S. haematobium eggs in the lamina propria and detrusor muscle (muscularis propria) induce extreme chronic inflammation and fibrosis, leading to squamous metaplasia and urothelial hyperplasia [52]. This, in turn, increases risk of urinary bladder carcinoma, squamous, urothelial, and adenocarcinomas.

WHO Classification of tumours of the urinary tract (year 2016)[53].

1) Infiltrating urothelial carcinoma

2)Non invasive urothelial lesion

a) Urothelial carcinoma in situ

b) Non invasive papillary urothelial carcinoma

c) Papillary urothelial neoplasms of low malignant potential

d) Urothelial papilloma

e) Inverted urothelial papilloma

f) Urothelial proliferation of uncertain malignant potential

g) Urothelial dysplasia

3) Squamous cell neoplasms

a) Pure squamous cell carcinoma

b) Verrucous carcinoma

c) Squamous cell papilloma

4) Glandular neoplasms

a) Adenocarcinoma

b) Villous adenoma

5) Urachal carcinoma

6) Tumours of mullerian type

7) Neuroendocrine tumours

a) Small cell neuroendocrine carcinoma

b) Large cell neuroendocrine carcinoma

c) Well differentiated neuroendocrine tumour

d) Paraganglioma

8) Melanocytic tumors

a) Malignant melanoma

b) Naevus

c) Melanosis

9) Mesenchymal tumours

a) Rhabdomyosarcoma

b) Leiomyosarcoma

c) Angiosarcoma

d)Inflammatory myofibroblastic tumour

e) Perivascular epithelioid cell tumour

f) Solitary fibrous tumour

g) Leiomyoma

h) Hemangioma

i) Granular cell tumour

j) Neurofibroma

10) Hematopoietic and lymphoid tumours

a) Lymphoma

b) Plasmacytoma

11) Miscellaneous tumours

a) Carcinoma of Skene,Cowper and Littre glands

b) Epithelial tumours of the upper urinary tract

c) Epithelial tumours arising in a bladder diverticulum

d) Urothelial tumours of the urethra

Non-Invasive urothelial lesions

The types of papillary neoplasms included in this classification are the following: urothelial papilloma, papillary urothelial neoplasm of low malignant potential (PUNLMP), non-invasive papillary urothelial carcinoma, low grade and non-invasive papillary urothelial carcinoma, high grade. Exophytic urothelial papilloma has a very basic branching papillary architecture with no epithelial confluence between papillary excrescences.[54] The urothelial lining is histologically normal with orientation of neoplastic cells streaming upward with very prominent umbrella cells. PUNLMP is similar, but the lining appears thickened on low-power examination compared with normal urothelium.[55]Non-invasive papillary urothelial carcinoma, low grade has disorganized urothelium that has mild loss of polarity with mild cytologic atypia. The papillae are more complex and confluent compared with papilloma and PUNLMP. Non-invasive papillary urothelial carcinoma, high grade shows combination of nucleomegaly, nuclear size and shape variation and irregular nuclear chromatin. There can also be seen a solid confluent epithelial growth between papillae and marked anaplasia.

Infiltrating Urothelial Carcinoma

Infiltrating urothelial carcinoma shows irregularly distributed nests of urothelial cellswith rounded or jagged contours. Stromal response to invasive urothelial carcinoma includes fibrosis, inflammatory reaction, desmoplasia, myxoid change, stromal retraction clefts or no response. Numerous architectural patterns, such as varying-sized nests with smooth edges, sheets, trabeculae, cords and single cells can be seen in infiltrating urothelial carcinoma. In larger nests, the tumour cells may show stratified architecture with the nuclei being perpendicular to basement membrane. Nuclear pleomorphism is prominent, with hyperchromatic nuclei that vary in size and form. The nuclei frequently have sharp edges and uneven nuclear shapes. There are many mitoses and aberrant mitotic figures. Normally, the cytoplasm is moderately pale to eosinophilic.

Micropapillary carcinoma of the urinary bladder histologically mimics ovarian serous carcinoma. [56]Multiple epithelial aggregates/nests within a single retraction space and confluent "back-to-back" retraction spaces are typical characteristics.[57]Lymph node metastases are common.[58]While controversial, some have advocated for immediate cystectomy for micropapillary carcinoma, regardless of stage so it is important to not over diagnose micropapillary based on stromal retraction alone.[59]

Plasmacytoid carcinoma of urinary bladder shares similar morphology with lobular breast cancer and diffuse-type gastric cancer. [60] The monomorphic round neoplastic cells are discohesive and grow singly or in clusters. They frequently feature an eccentrically positioned nucleus and homogenous eosinophilic cytoplasm. Because of this latter feature, distinction from signet ring cell type adenocarcinoma is based on the existence of associated extracellular mucin. [61] Immunophenotypically, plasmacytoid carcinoma typically expresses cytokeratins, CD138, CK20, and GATA3 but p63 is less sensitive in this variant. [62] ER expression is typically absent, a helpful feature to differentiate from

metastatic lobular breast cancer. Plasmacytoid carcinoma of urinary bladder has a pattern of spread that is distinct from typical urothelial carcinoma, with involvement of serosal surfaces, parenchymal organs and recurrence as malignant effusions.[63]

Nested urothelial carcinoma has rounded aggregates having cytologically bland urothelium, the irregular distribution of these aggregates beneath the urothelium is diagnostically important in distinguishing from benign von Brunn nests.[64] Some cases have central cystic change mimicking cystitis cystica or glandularis but they too have an irregular distribution that often extends deeply into the underlying tissues.[65]

Lymphoepithelioma-like carcinoma has appearance of a nonkeratinizing carcinoma associated with a heavy inflammatory infiltrate.[66] Some cases are pure, in which the carcinoma may be masked by the inflammatory cells, but most represent a focal or extensive change in a tumour having otherwise the appearance of a urothelial carcinoma.[67]

Sarcomatoid (spindle cell, metaplastic) carcinoma is high-grade tumour of urinary bladder in which a malignant epithelial component coexists with areas having a spindled “sarcoma-like” appearance. [68]The latter may display distinct characteristics of mesenchymal differentiation, such as rhabdomyosarcoma, chondrosarcoma, osteosarcoma, liposarcoma, or pleomorphic undifferentiated sarcoma, or it may have a general spindle cell or pleomorphic morphology. [69] These tumours are typically big and polypoid grossly.The differential diagnosis includes true sarcomas, inflammatory myofibroblastic tumour, and urothelial carcinomas with reactive stroma. [70] Most patients with sarcomatoid carcinoma are elderly males.

The immunophenotype of urothelial carcinoma is heterogeneous, particularly across variant forms. The neoplastic cells express CK7, CK20, p63, and high-molecular-weight cytokeratin.[71] GATA3 commonly shows nuclear staining in urothelial carcinoma.

Squamous cell neoplasms

Pure squamous cell carcinoma is a carcinoma which is derived from the urothelium with a histologically pure squamous cell phenotype. Bladder SCC is only diagnosed in tumours that contain only squamous features, seen as intercellular bridges and keratin pearls. [72] If urothelial carcinoma in situ or any component of conventional urothelial carcinoma is observed, the tumour should be classified as urothelial carcinoma with squamous differentiation. Well-differentiated SCC is composed of nests of squamous cells displaying individual cell keratinization, prominent intercellular bridges and minimal nuclear pleomorphism. Tumour cells with a high nuclear-to-cytoplasmic ratio, marked nuclear pleomorphism, increased mitotic activity, and focal squamous differentiation are indicative of poorly differentiated SCC. There have also been isolated reports of a basaloid type of SCC, which is linked to HPV and is observed in individuals undergoing chronic catheterization.[73]

Verrucous carcinoma is a squamous neoplasm that is exophytic. It has many filliform projections that are surrounded by thick folds of well-differentiated squamous epithelium, and its edge is pushing rather than infiltrative. They have minimal nuclear and architectural atypia, papillary proliferations with epithelial acanthosis and hyperkeratosis, rounded, pushing boundaries without jagged, irregularly invasive nests, and are exophytic histologically.[74]The entire lesion should be evaluated to rule out the existence of conventional invasive squamous cell carcinoma in order to make the diagnosis of verrucous carcinoma.

Squamous cell papilloma is benign epithelial tumour arising from urothelial lining in the form of a surface excrescence with connective tissue core which is covered by benign keratinizing squamous cells. It is a very rare benign neoplasm. It occurs mainly in elderly patients.

Glandular Neoplasms

Adenocarcinoma is a form of cancerous tumour that originates from the urothelium and exhibits a pure glandular character on histology. It makes up only 0.5–2% of all malignant tumours, making it a rare occurrence. [75] It is more frequent in men and affects adults, peaking in occurrence in the sixth decade of life. [76] This tumour is linked to long-term intestinal metaplasia, especially in individuals with urinary bladder exstrophy and persistent chronic irritation.

Enteric adenocarcinoma is similar in morphology to gastrointestinal counterpart. The glands are lined by pseudostratified mucin-secreting epithelium with various degrees of pleomorphism and with central necrosis.

Mucinous adenocarcinoma– There are seen nests of tumour cells floating in a pool of extravasated mucin. In certain cases, solitary cells with signet ring shape are observed.

Mixed adenocarcinoma -Tumours having admixture of enteric and mucinous patterns are the most common histology of adenocarcinoma. The immunohistochemical profile is identical to that of gastrointestinal adenocarcinoma. The tumours express CDX2 and CK20. For primary adenocarcinoma to be definitively diagnosed, clinical correlation is required.

Villous adenoma is benign tumour of urachus and urinary system which is similar to its colonic counterpart. [77] These affect adults, with a mean patient age of 65. It is a papillary neoplasm that may be mistaken for a papillary urothelial neoplasm cystoscopically. The tumour's histology reveals elongated villi surrounded by epithelia of the intestinal type. Maximum cases of tumours have low-grade dysplasia, but they can also have high-grade dysplasia or even adenocarcinoma in situ. The tumours are immunopositive for CK7,CK20and CDX2 and immunonegative for GATA3, prostate-specific antigen and prostate-specific acid phosphatase.

Urachal Carcinoma

Malignant epithelial neoplasms that originate from urachal remnants are known as urachal carcinomas. Urachal carcinomas are mostly adenocarcinomas. Mostly occurs in 50-60 years of age. It might appear in the anterior wall or bladder dome, and it can even reach the umbilicus. Non-cystic adenocarcinomas are the most frequent type, making up 83% of cases. [78] Cystic tumours account for 17%. The histological spectrum of primary urinary bladder adenocarcinomas and non-cystic urachal adenocarcinomas is comparable. [79]Mucinous type consists of cells with intracellular and extracellular mucin with floating mucinous cells and occasional signet ring cells. These tumours are now classified as plasmacytoid carcinomas. Mucinous cystadenocarcinoma has prominent cystic component. The non-glandular carcinomas are rare and can be pure or mixed. [80]Immunohistochemically, urachal adenocarcinomas express CDX2, CK20, Reg IV and 34BE 12. [81]

Tumours of Mullerian Type

Mullerian-type tumours, which include endometrioid and clear cell carcinomas, develop from pre-existing Mullerian progenitors within the bladder. Mullerian-type tumours are variants of adenocarcinoma, with microscopic features resembling those of clear cell and endometrioid carcinomas of Mullerian origin in the female genital tract. Clear cell carcinoma is more common than endometrioid carcinoma, but it is rare. [82] Clear cell carcinoma is commonly seen in the bladder neck or trigone and less common in lower posterior wall. Endometrioid carcinoma typically arises from the wall of urinary bladder and it is more common in the trigone or the posterior wall. The morphology of clear cell carcinoma is characterized by the presence of tubulocystic, papillary, and diffuse morphological features that are common in the female genital tract. The most prevalent pattern is tubulocystic, while diffuse development is the least frequent and least prominent type.[83] Tubules have variation in size and shape and may contain basophilic or eosinophilic secretion or both. The papillae are rounded and small

with extensively hyalinized fibrovascular cores.The tumour cells might be flat, cuboidal, or columnar, and their cytoplasm can be either eosinophilic or clear, or a combination of the two. Brisk mitotic activity and moderate to severe cytological atypia are typical. Clear cell carcinomas are typically positive for CAM5.2, CK7, epithelial membrane antigen, PAX8, HNF1b, AMACR, and CA-125. These tumours also show high Ki-67 immunoreactivity and are p53-positive.[84] Endometrioid carcinoma has a variable histological appearance. Well differentiated tumours have endometrioid-type glands that may show squamous, mucinous, or other metaplastic changes. The histology of endometrioid carcinoma of the urinary tract parallels that seen in its endometrial and ovarian counterparts, the immunohistochemical profiles also likely overlap, including estrogen and progesterone positivity.[85]

Neuroendocrine Tumours

Small cell neuroendocrine carcinoma is a malignant neoplasm having neuroendocrine differentiation. They have the same histological features as their pulmonary counterparts. It is a rare tumour accounting for <1% of all bladder tumours. At presentation, all of them are invasive, with the majority being invasive up to the level of the muscularis propria. Individual tumour cells are present in sheets and separated by scanty stroma. The nuclei of the cells are small, overlapping, spherical to oval, and lack conspicuous nucleoli with sparse cytoplasm. Brisk mitosis noted. Immunohistochemically it is positive for synaptophysin, chromogranin and neuron-specific enolase. Differentials includes metastasis, malignant lymphoma and poorly differentiated urothelial carcinoma.

High mitotic activity, neuroendocrine characteristics on H&E staining, and immunohistochemistry evidence of neuroendocrine differentiation characterize large cell neuroendocrine carcinoma, a high-grade tumour.

Well-differentiated neuroendocrine tumour arises from isolated neuroendocrine cells located in the basal layer of the urothelium. The cells in the majority of the tumours are grouped in a pseudoglandular pattern and are linked to cystitis cystica and cystitis glandularis. This characteristic can cause the tumours to be mistakenly diagnosed as non-neoplastic conditions. In addition to expressing neuroendocrine markers immunohistochemically, bladder well-differentiated neuroendocrine tumours also express prostate-specific acid phosphatase but do not express other prostate markers.

Paraganglioma of urinary bladder is derived from paraganglion cells in the bladder wall. Cells are arranged in distinctive nests (called Zellballen). Pseudorosette formations can exist. [86]Fibrous septa or a delicate plexiform vascular network divides them. Large, polygonal cells with central or eccentric nuclei and cytoplasm that is either acidophilic or amphophilic. Diagnosis can be confirmed with positive immunostaining for neuroendocrine markers and for S100 in sustentacular cells. Bladder paragangliomas express GATA3 in 83% of all cases and in 80% of cases at metastatic sites. [87]

Melanocytic Tumours

A malignant tumour of melanocytic origin is called malignant melanoma. The following conditions must be satisfied for a malignant melanoma to be classified as primary: there must be no indication of a regressed melanoma, no concurrent or prior cutaneous melanoma, and a pattern of metastases compatible with a urinary tract primary. [88] Malignant melanomas of the urothelial tract account for < 1 % of all melanomas. [89] A classic microscopic feature present in most cases is presence of large epithelioid or spindle cells, sometimes containing melanin pigment. S100 protein, HMB45, and melan A are expressed. These have a poor prognosis correlated with the depth of invasion.

Nevus is a benign proliferation of melanocytes. It consists of melanocytic cells with HMB45, melan A and KIT expression.

The unusual disorder known as melanosisis brought on by presence of melanin-containing macrophages in the lamina propria or melanin-containing epithelial cells in the urothelial lining.

Mesenchymal Tumours

Skeletal muscle differentiation is evident in rhabdomyosarcoma, a malignant mesenchymal tumour. It is the most prevalent sarcoma in children. [90] Rhabdomyosarcoma of children is usually of the embryonal type and the alveolar type accounts for < 10% of tumours, typically occurring in older children and adolescents. [91] Embryonal rhabdomyosarcoma is variable lesion consisting of primitive spindled to round cells in myxoid background. Some may contain numerous rhabdomyoblasts with either spindled or more epithelioid morphology. Alveolar rhabdomyosarcoma typically grows as nests containing primitive round cells, occasionally with scattered rhabdomyoblasts or multinucleated tumour giant cells surrounded by a highly vascular, fibroblastic stroma. Spindle cell sclerosing rhabdomyosarcoma, seen in adults, typically shows both fibrosarcoma-like spindled cells and nests of round cellsin a densely hyalinized matrix that may resemble osteoid or chondroid. [92] Pleomorphic rhabdomyosarcoma typically consists of sheets of markedly pleomorphic, mitotically active spindle shaped to epithelioid cells with abundant eosinophilic cytoplasm. [93] MyoD1 and myogenin are the most sensitive and specific markers of rhabdomyoblastic differentiation. [94]

Leiomyosarcoma is a sarcoma arising from or differentiating along the lines of normal urinary bladder smooth muscle. Forming 1% of all bladder cancers, it is the most prevalent kind of adult urinary bladder sarcoma. At diagnosis, the average patient age is 65 years old. Classic leiomyosarcoma is an infiltrative lesion composed of intersecting fascicles of eosinophilic spindle shaped cells with cigar shaped nuclei and perinuclear vacuolations. The tumour exhibits cytological atypia, hypercellularity and mitotic activity including atypical forms. Tumours

are graded by a combination of factors including differentiation, mitotic activity and necrosis. The tumours are immunoreactive for smooth muscle actin, desmin and h caldesmon.

Angiosarcoma is rare tumour of the urinary bladder showing endothelial differentiation. The tumours cells have malignant endothelial cells arranged in combination of solid areas and anastomosing vascular channels. In most tumours, spindled endothelial cells predominate but tumours may also be an admixture of spindled and epithelioid cells or entirely epithelioid. [95] They are immunoreactive for endothelial markers including CD31, CD34 and ERG.

Inflammatory myofibroblastic tumour is a neoplasm of fibroblastic and myofibroblastic origin. It is found predominantly in the abdominal cavity and the retroperitoneum. The tumours can occur anywhere within the bladder. [96]In an inflammatory myofibroblastic tumour, there are three histological patterns that frequently coexist: loose stellate cells in a myxoid background with inflammatory cells, spindle cells with a fascicular pattern, and collagenized areas with scant cell density. lmmunohistochemically, the tumours are positive for smooth muscle actin and desmin, and often exhibit aberrant cytokeratin expression; however, these markers are not useful for distinguishing inflammatory myofibroblastic tumour from leiomyosarcoma and sarcomatoid carcinoma. ALK1 is positive in approximately 60% of cases, and is helpful in distinguishing this tumour from other malignant spindle cell tumours of the bladder. [97]Differential diagnosis is Sarcomatoid urothelial carcinoma.

Perivascular epithelioid cell tumour is a neoplasm that exhibits melanocytic and smooth muscle differentiation and arises from perivascular epithelioid cells. The tumours can occur anywhere in the bladder. The tumour has cells with abundant clear cytoplasm and is either circumscribed or infiltrative. These tumours exhibit two histopathological patterns: spindled and epithelioid. One pattern may

predominate or tumours may be mixed. The tumours are organized into fascicles and nests, and the cytoplasm of the cells is eosinophilic and transparent. Prominent blood arteries may exhibit signs of perivascular sclerosis. Benign tumours are those that are smaller than 5 cm in size, have low nuclear grade and cellularity, and don't have infiltration, necrosis, or vascular invasion. Malignant tumours, on the other hand, have two or more of these characteristics. Tumours express muscle actin, HMB45, melan A, tyrosinase. [98]

Solitary fibrous tumour is a fibroblastic mesenchymal tumour with malignant potential, typically containing NAB2-STAT6 gene fusion and overexpressing STAT6. The tumours show hypo- and hypercellular zones, with a haphazard whorled arrangement of spindle cells with lace-like intervening collagen. The tumours typically have a haemangiopericytomatous vascular pattern. They are immunopositivefor CD34 and STAT6.

A benign tumour of smooth muscle is called a leiomyoma. It is the most prevalent benign mesenchymal tumour of the bladder, making up less than 1% of all bladder tumours. [99] They are confined, non-infiltrative tumours with poor cellularity, little to no cytological atypia, and little mitotic activity. Tumour cells are positive for h caldesmon, desmin, and muscle actin.

Hemangioma is a benign vasoformative growth.

Granular cell tumour has large polygonal cells with abundant cytoplasm due to lysosome accumulation. The tumour is of Schwann cell origin. The tumours are composed of cells having granular eosinophilic cytoplasm. The tumours are S100-positive.

Neurofibroma of the urinary bladder is an uncommon benign peripheral nerve sheath tumour. Neurofibromas occur as plexiform or diffuse types. Nearly all plexiform neurofibromas are associated with neurofibromatosis. The plexiform tumour has coalescent nodules of spindle shaped cells in a collagenous stroma. Diffuse neurofibromas

expand the lamina propria and can extend into the muscularis propria. They are S-100 positive.

Hematopoietic and lymphoid tumours

Malignant lymphoma is a type of lymphoid neoplasm that can affect the urinary tract either as a standalone tumour or part oflarger systemic illness. Extranodal marginal zone B-cell lymphomas of mucosa-associated lymphoid tissue origin (MALT lymphomas) are the most prevalent kind in the bladder. [100] Other primary lymphomas of the bladder that have been described include anaplastic large cell lymphoma, Burkitt lymphoma, diffuse large B-cell lymphoma, Hodgkin lymphoma and T-cell lymphoma.

Plasmacytoma is a clonal proliferation of malignant plasma cells that is morphologically and immunophenotypically identical to plasma cell myeloma. For a diagnosis of primary plasmacytoma, a complete clinical and radiographical work-up must show no evidence of plasmacytoma at other sites.

In a study done by Srikousthubha, Sukesh et al in 2013, every patient who came to the urology outpatient department with hematuria had cystoscopy done. Fifty three cystoscopic biopsies that were performed during a two-year period were analyzed. It turned out that 3 biopsies were insufficient. Half of the cases (25 cases) had non-neoplastic lesions, while the other half—had neoplastic lesions. Of the 25 non-neoplastic lesions, 2 (08%) were classified as epithelial abnormalities, 2 (84%) as inflammatory lesions, and 2 (08%) as tumour-like lesions. Out of the 21 inflammatory lesions, 3 (14.28%) had tubercular cystitis, 1 (4.76%) had eosinophilic, hemorrhagic, and follicular cystitis, and 15 (71.4%) had polypoid type chronic non-specific cystitis. Two cases of inflammatory pseudotumor and 1 each of malakoplakia and tumour-like lesions were reported. von Brunn's nest with cystitis cystica and squamous metaplasia were two examples of aberrant epithelium. Of the 25 neoplastic lesions observed, 24 patients (96%) had urothelial

neoplasms and 1 case (04%) was squamous cell carcinoma. Urothelial neoplasms were by far the most prevalent type of neoplasms (96%).Of the 24 cases of urothelial neoplasms, 3 cases (12.5%) were invasive. In 2 of the 3 cases of invasive urothelial carcinomas, the carcinomas were infiltrating, and in 1 of the cases, the carcinoma was infiltrating but had a squamous differentiation. Of the 21 cases of non-invasive urothelial carcinoma, 15 cases (71.42%) were low grade and 5 cases (23.8%) were high grade and 1 case (4.76%) was papillary urothelial neoplasm with a low malignant potential, or PUNLMP. The most common age range for those with neoplasms was 60–69 years old. Of the 24 cases of urothelial neoplasm that were reviewed, haematuria was observed in all of them. On cystoscopy, papillary exophytic growths were observed in 21 cases and solid lesions in 3 cases.[101]

According to a prospective study done at ACPM Medical College, Maharashtra by Dravid NV, Rajeshwari K, Kari Basappa GN et al in 2016, neoplastic bladder lesions made up 73.38% while non-neoplastic bladder lesions made up 26.6% of the 139 cystoscopy biopsies. Benign lesions constituted 10.79% of neoplastic cases, while malignant lesions constituted 62.58% of cases. Urothelial carcinoma was the most frequent malignant lesion, accounting for 55.39% of cases. High grade and invasive papillary urothelial carcinoma were more common, accounting for 78.25% of cases and 55.39% of cases, respectively. The growth pattern, level of differentiation, progression, and associated mucosal changes of the tumor were evaluated. In 15 cases of urothelial papilloma, discrete papillary development with a central fibrovascular core surrounded by urothelium with normal thickness and cytology were seen. Five PUNLMP cases had delicate, orderly papillary structures with few architectural defects and an orderly cell arrangement inside papillae, along with atypia restricted to the basal layer regardless of thickness. More compact, packed papillae exhibiting both architectural and cytologic abnormalities were observed in 21 cases of low-grade urothelial cancer. 51 cases of high-grade urothelial carcinoma, on the other hand, revealed tumour cells with larger,

hyperchromatic, pleomorphic nuclei and enhanced mitosis that were present in sheets and solid patches.[102]

A retrospective study done by C. Aparna et al over a period of 3 years in June 2016 was published in International Journal by the Department of pathology Guntur medical College. There were 38 cases in all, of which neoplastic lesions constituted 68.5%and non-neoplastic lesions constituted 31.5% of all cases. Out of the neoplastic lesions, 84.6% were urothelial carcinomas of different grades and 15.4% were squamous cell carcinomas. Males were affected 5 times more as compared to females. Most common age group affected was 41 to 60 years. Of the 26 cases, 18 had high-grade neoplasms and 6 had low-grade neoplasms. Of the non-neoplastic conditions, there were 8 cases of non-specific cystitis, 2 cases of exstrophy exhibiting metaplastic alterations, and 1 case of cystitis glandularis. Out of the 26 neoplastic lesions, 4 cases had squamous cell carcinoma and 22 cases had papillary urothelial carcinoma.Out of the 22 papillary urothelial carcinoma patients, 6 were low grade, 8 were high grade, and 7 displayed squamous differentiation.[103]

In a retrospective study by Preeti N Jhaveri et al from June 2016- Oct 2018 in Pathology department of Smt. N.H.L. medical college. All cases of urothelial carcinomas were graded histologically according to WHO (2016)/ISUP classification. Patients between the ages of 60 and 69 made up the largest group. The incidence of carcinoma was higher in men as compared to women. Infiltrating Urothelial Carcinoma (81.06%) accounted for the majority of cases; low grade (37.8%) predominated over high grade (35.14%). Detrusor muscle was invaded in 80%cases of infiltrating urothelial cell carcinoma, high grade. Lateral wall was most common location of urinary bladder tumour, followed by anterior wall, posterior wall and bladder neck.Thirty three cases (89%) of urothelial neoplasm, 2 cases of squamous cell carcinoma, and 1 case of each of embryonic rhabdomyosarcoma and leiomyoma were among the 37 neoplastic lesions. Six of the 33 cases of urothelial

neoplasm were non-invasive urothelial lesions, and the remaining 27 cases had infiltrating urothelial cancer. Out of 6 cases of non-invasive urothelial lesions, non-invasive papillary urothelial carcinoma, low grade was noted in 3 case and 3 cases were of papillary urothelial neoplasm with a low malignant potential (PUNLMP). Lamina propria invasion was seen in 26 cases while Detrusor muscle invasion was present in 10 patients. The Detrusor muscle was absent in 6 cystoscopic biopsies. Therefore, in the remaining 21 cases, muscle invasion could be evaluated. Out of the 10 cases with muscle invasion, 2 had low-grade and 8 had high-grade invasive urothelial carcinoma. Two patients in the current investigation had differentiation, and both displayed squamous differentiation. [104]

In a retrospective study done in 2017 by Dr Suba J, Dr Gayathri J, Dr Jayaprakash at Department of Pathology, Dr BRAMC ,Bangalore, Karnataka consisted of 70 cases of cystoscopic bladder biopsies. Three biopsies were inadequate for opinion. Of the remaining 67 cases ,38 cases were neoplastic and 29 were non-neoplastic. Majority cases wereseen in 41-50 years age with male predominance. Urothelial tumours were predominant lesions under neoplastic category of which invasive papillary urothelial carcinoma was the most common subtype. Among non-neoplastic lesions, chronic non-specific cystitis was the commonest lesion noted. Of the 29 non neoplastic lesions, 15(51.7%) were chronic nonspecific cystitis, 5(17.2%) were follicular cystitis and 3(10.3%) were granulomatous cystitis. Other lesions like eosinophilic cystitis, hemorrhagic cystitis and von Brunn's nest were observed in 2 (6.9%), 1(3.5%) and 3(10.3%) cases respectively. Urothelial tumours formed the majority of the neoplastic category. They constituted 94.7% (36 cases) of all neoplastic lesions. The remaining 2 cases (5.3%) were secondary adenocarcinomas. The most frequent subtype of all urothelial tumors, accounting for 29 cases (80.6%), was infiltrating urothelial carcinoma, of which 8 cases were of low grade and 21 cases were high grade. One high-grade tumour was a clear cell variety of invasive urothelial carcinoma, and the other 4 displayed squamous

differentiation.Out of 5 (13.9%) non-invasive papillary urothelial carcinomas, 4 were low grade lesions and 1 was high grade lesion. Papillary urothelial neoplasm of low malignant potential was observed in 2 (5.6%) cases.[105]

In study done by Dr Anita Shah et al in the year 2018 for a period of 12 months at Department of pathology, University College of Medical Sciences Nepal, among the 36 cases studied, majority urinary bladder lesions were in age group 61-70 years. The most common symptom was hematuria. Among 36 cases. 30.55% had non-neoplastic lesions and 69.55% had neoplastic lesions. Among non-neoplastic cases, 5.55% had chronic granulomatous inflammation. Most common lesion was infiltrating urothelial carcinoma followed by non-invasive urothelial neoplasm. Among the neoplastic lesions (65.95%), most common was urothelial tumours comprising of 6 cases of infiltrating urothelial carcinoma followed by 5 cases of non- invasive urothelial neoplasia. The least common amongst the neoplastic lesions was glandular neoplasms comprising of one (2.78%) case of papillary adenoma and one case of villous adenoma. [106]

In a prospective study done at Government Medical College, Nagpur in 2018 by Anupama Praveen Gupta, Anuradha Gupta et al, 60cystoscopic bladder biopsies were received out of which 19 were non - neoplastic and 41 neoplastic. The age distribution was 1 to 90 years old, with 56 being the average. Hematuria was the most prevalent symptom in both the non-neoplastic and neoplastic groups. Nineteen of the 60 cases were non-neoplastic, and 41 were non-neoplastic. Non-neoplastic conditions included 9 cases of metaplasic and tumor-like diseases and 8 cases of inflammatory pathology. Out of the 8 inflammatory lesions, 4 individuals had follicular cystitis, 2 had tuberculous cystitis, and 2 had eosinophilic cystitis. Of the 9 metaplastic lesions, 4 had squamous metaplasia, 4 had cystitis cystica, and 1 had nephrogenic metaplasia. Neoplastic group comprised of 1 case of papilloma and papillary urothelial neoplasm of low malignant potential (PUNLMP) each, 28 cases of transitional cell carcinoma

(TCC), 3 cases of adenocarcinoma, 6 cases of squamous cell carcinoma (SCC) and 1 case of small cell carcinoma and embryonal rhabdomyosarcoma each. All low-grade tumours were papillary in configuration whereas solid or mixed types predominated in high grade tumours. Detrusor muscle invasion was detected in 8 cases and lymphovascular invasion was seen in 2 cases.[107]

A study was done in 2019 by Dr K Papa Ratnam, Dr S Jagadeeswari, Dr S Krishna Kumari which appeared in International Journal of Scientific Research inNovember 2019. Out of the 54 biopsies received,12 were non-neoplastic, and 40 were neoplastic. Majority of the cases were in 60-79 years age group. Males were affected more than females. Majority of the neoplastic lesions were urothelial carcinomas. Among non-neoplastic lesions, chronic cystitis was common. Most common neoplastic lesion was high grade urothelial carcinoma, mostly non-invasive. Male to female ratio was 2.8 :1, similar male preponderance was in neoplastic lesions seen as 3:1. As per histological grading -WHO/ISUP(2004) used in the study showed high prevalence of high-grade urothelial carcinoma, followed by low grade urothelial carcinoma. Muscle invasion was seen in 2 cases and lamina propria invasion in 1 case of high grade papillary urothelial carcinoma whereas none of the cases of low grade papillary urothelial carcinoma showed muscle invasion. [108]

In a retrospective study done at Department of Pathology SKIMS, Soura, India, in 2019, by Yaavarshafi, Danish Rafiq et al, a total of 433 cases were received. Of these, 413 cases (95.7%) were TUR biopsies, and 13 cases(3%) were cystectomy specimens. Of the samples, 411 (94.92%) cases were found to be neoplastic, while 22 (5.08%) were non-neoplastic. Of the 353 cases of bladder lesions in men, 16 cases were benign, 319 cases were found to be malignant, and 18 cases were non-neoplastic. In general, males (81.52%) had urinary bladder lesions almost 4 times more frequently than females (18.48%). The age range in which the greatest number of males and females were found was 50–60 years. With 379 cases (92.21%), transitional cell

carcinoma was the most prevalent malignancy, followed by 12 cases (2.92%) of PUNLMP. There were four cases (0.97%) of metastatic disease, including two (0.49%) of metastasis from SCC cervix and two (0.49%) of metastasis from prostatic adenocarcinoma; there were also four cases (0.97%) of primary adenocarcinoma of the bladder, one case each of primary SCC of the bladder, sarcomatoid carcinoma, paraganglioma, leiomyosarcoma, inflammatory myofibroblastictumor, inverted papilloma, leiomyoma, and hemangioma. In 99 cases (26.77%), no muscle was found. Muscle invasion cases increased with advancing age.[109]

In another retrospective study done by S Preethamol, PS Prasanth et al at a tertiary care centre in Kerala over 6 months in year 2020, a total of 742 lesions were histologically evaluated out of which a total of 688 cases were neoplastic and 46 cases non- neoplastic. A total of 646 cases were males. Most commonly affected age group was 61 to 80 years. Hematuria was the most common clinical presentation. Most common non-neoplastic lesion was non-specific cystitis (17 cases), followed by 13 cases of cystitis glandularis. Among neoplastic lesions, urothelial carcinoma was the predominant type 678 cases (98.54%) and was most commonly seen in age group of 61-80 years constituting 431 cases (62.64%). These neoplastic lesions were more common among males, 608 cases (81.94 %) with M:F ratio of 7.6:1. Non-invasive papillary urothelial neoplasm low grade was the predominant type having 332 cases (48.25%) followed by 166 cases (24.1%) of non-invasive papillary urothelial neoplasm high grade and 149 cases (21.6%) of infiltrating urothelial carcinoma. All infiltrative urothelial carcinomas had deep muscle invasion, which was totally absent in non-invasive papillary urothelial neoplasms both low grade and high grade. Of the total149 invasive urothelial carcinomas studied, 127 cases (85.23%) were infiltrating urothelial carcinomas. Of these, 21 cases of infiltrating urothelial carcinomas showed squamous differentiation (14.58%) and one case with glandular differentiation (0.69%). [110]

A prospective study done on histological analysis of urinary bladder specimens by Sushmitha S et al at Gadag Institute of Medical Sciences, Karnataka. A totalof 65 cases were studied, 30 were cystoscopic biopsies and 35 were TURBT specimens. There were 40 males and 25 females constituting up to 61.54% and 38.46% respectively. Chronic non-specific cystitis was the common non-neoplastic lesion. Among neoplastic lesions, infiltrating urothelial carcinoma was the predominant lesion constituting 22 cases (62.86%). These neoplastic lesions were more common among males (74.28%) with M:F ratio of 2.8:1. Chronic nonspecific cystitis was the most common type of non-neoplastic lesion, accounting for up to 66.67% of all cases. Other types of cystitis received were 3 cases of acute on chronic cystitis, 1 case each of granulomatous cystitis, polypoidal cystitis, eosinophilic and follicular cystitis. Among the neoplastic lesions, infiltrating urothelial carcinoma (IUC) was found to be predominant type constituting 22 cases (62.86%), followed by 4 cases (11.43%) of Papillary urothelial neoplasm of low malignant potential, 6 cases (17.14%) of non-invasive papillary urothelial carcinoma, low grade, 2 cases (5.71%) of non-invasive papillary urothelial carcinoma, high grade and one case (2.86%) of urothelial carcinoma in situ (CIS)The current investigation revealed a noteworthy rise in the number of neoplastic lesions among the age range of 61 to 80 years.[111]

In a retrospective study done by Priyamvada et al at Subharti Medical College, Meerut in 2019, histopathological analysis of all urinary bladder biopsies and radical cystectomy/ cystoprostatectomy was done. Of the 271 samples that were obtained, 18 of them were insufficient, 1 biopsy revealed no discernible disease, and in 252 instances, a pathologic diagnosis was made. There were 52 cases of non-neoplastic lesions followed by 200 cases of neoplastic lesions. The ratio of men to women was 7:1. In this study, males with non-neoplastic and neoplastic lesions made up 39 (75%) and 183 (91.5%) of the

cases, respectively. Most common non-neoplastic lesion was chronic cystitis constituting 43 cases (82.6%), followed by other variants like acute or chronic, eosinophilic and foreign body giant cell reaction. Three cases of cystitis glandularis, 1 case of malakoplakia, and 1 case of inflamed urachal cyst were reported. Ninety-seven percent (194) of all neoplastic lesions across different histomorphological groups were urothelial tumours. Of the 118 IUC instances, 88 (74.5%) were classified as conventional IUC, and 30 (25.5%) as IUC with divergent differentiation. Squamous (24 cases), glandular (2 cases), poorly differentiated (2 cases), micropapillary, and mixed glandular and microcystic (1 case each) variants were identified. There were also 2 cases of prostate metastasis and primary adenocarcinoma, 1 case of small cell neuroendocrine carcinoma, and 1 case of melanosis. In non-invasive lesions out of 76 cases, 27 cases were of Papillary Urothelial Neoplasm of Low Malignant Potential (PUNLMP) followed by 16 cases of urothelial carcinoma in situ, 16 cases of papillary urothelial neoplasm- low grade and 8 cases of papillary urothelial neoplasm- high grade. Sixteen cases (10%) had carcinoma in situ (pTis), while 24 (15%) had non-invasive papillary cancer (pTa). There were 59 (37%) cases of lamina propria invasion (pT1) and 56 (35%) cases of pT2 (tumors infiltrating muscle). Tumours of pT3 and pT4 were discovered in 2 (1.3%) and 4 (2.7%) of the patients, respectively.[112]

A total of 58 biopsies were studied over a period of August 2020 to July 2022 in the department of Pathology at GMCH, Udaipur by Reeti Pokar, Riddhi Parsana et. Hematuria was the most frequent presenting symptom. Thirty-six cases of infiltrating urothelial carcinoma were seen of which there were 33 high-grade and 3 low-grade cases. The ratio of men to women was 7:1. Most common symptom was hematuria (91.4%) followed by increased frequency of micturition (32.8%), burning micturition (31%), dysuria (8.6%) and abdominal pain (6.9%) and lower urinary tract symptoms (3.5%). There were 19 cases of non-invasive urothelial lesions which included 16 cases of non-invasive papillary urothelial carcinoma, 1 case of carcinoma in-situ, Papillary

urothelial neoplasm of low malignant potential and urothelial proliferation of uncertain malignant potential each. Most common neoplastic lesion was infiltrating urothelial carcinoma (36 cases) comprising of 33 (91.66%) cases of high grade and 3 (8.33%) cases of low-grade malignancy. There was 1 case of squamous cell carcinoma, 1 case of undifferentiated urothelial carcinoma. In this study differentiation was seen in 3 cases in which 2 cases showed squamous differentiation and 1 case showed glandular differentiation.[113]

One-year cross-sectional observational study conducted by Deepika Sharma et al in the pathology and urology department of the Indira Gandhi Medical College in Shimla in July 2022. Study participants included 197 individuals with primary epithelial bladder cancer (TURBT and radical cystectomy) with a male to female ratio of 6.9:1. Urothelial carcinoma accounted for 98% of the lesion cases, with other kinds including squamous cell carcinoma (1%), small cell carcinoma (0.5%), and adenocarcinoma (0.5%) following closely behind. There were 67 cases (34.7%) of low-grade urothelial carcinoma among the 193 high-grade carcinomas that made up the bulk of urothelial tumors. 10 cases (17.9%) exhibited invasion that only reached the lamina propria out of the 46 non-invasive cases (82.1%). Four out of the 126 cases of high-grade urothelial carcinoma (HGUC) had no muscle tissue in the sample. Consequently, invasion was looked at in 122 cases. Ninety five cases (77.9%) had both lamina propria and muscle invasion.[114]

MATERIALS AND METHODS

The present 1.5 years prospective study from 15th September 2022 to 14th March 2024 on Histopathological spectrum of urinary bladder biopsies was conducted in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana. All the urinary bladder biopsies and cystectomy specimens received in the department were included in the study. Slides were subjected to IHC examination whenever possible.

Method of collection of data

Inclusion criteria

All urinary bladder biopsies and cystectomy specimens received in the Pathology department.

Exclusion criteria

- All other histopathological specimens
- Autolyzed specimens or tiny inadequate urinary bladder biopsy specimens

Duration of study

This was a 1.5 year prospective study starting from 15th September 2022 to 14th March 2024.

Study Design

This was a prospective study of 1.5 years duration.

Methodology

The tissue obtained in the histopathology laboratory was processed. Paraffin embedding and subsequent staining by Hematoxylin and Eosin was done. The slides were then subjected to histopathological examination

Hematoxylin and Eosin staining

The paraffin embedded tissue blocks cut at 2-3micron thickness by rotator microtome. Then the slides were kept on a hot plate in order to dewax the sections at temperature of 60 degree. Following this, the slides were deparaffinized in xylene, then hydrated through graded alcohol to water. Then it was stained with Harris hematoxylin for 15 minutes. The sections were washed well in running tap water until sections turned blue. The sections were then differentiated in 1% acid alcohol (1% HCL in 70% alcohol) for 5-10 seconds, washed well in tap water for 5 minutes or less. These were then stained with 1% eosin for 10 minutes followed by washing in running tap water for 1-5 minutes. Sections were dehydrated once again through graded alcohol, cleared xylene and mounted with DPX avoiding air bubbles.

Immunohistochemistry-standard streptavidin procedure

1.2-3 um sections were cut and mounted on Poly-L-lysine coated slides. Slides were dried overnight at 37 degree C and dewaxed in xylene and hydrated.

2. Antigen retrieval procedure- The black box was filled 3/4th with citrate buffer and the slide carrier with slides was placed in it. The black box was placed in microwave for 9 minutes.

3. Boiling of the solution was observed and the microwave was reset for 6minutes and started.

4. The box was removed and cooled under tap water.

5. Blocking endogenous peroxidase - Sections were incubated at room temperature in 0.3% H2O2 in methanol for 30-45 minutes and rinsed in running tap water for 5-10 minutes and then dipped in distilled water for 1 minute.

6. The slides were placed in Tris buffer [only one change for 5 minutes].

7. Blocking reagent was applied for 5-10 min and excess of it was wiped off.

8. Primary antibodies were applied covering the whole section and incubated at room temperature for 1 hour.

9. Slides were then washed in Tris buffer for 5 minutes.

10. Ultra Vision One HRP polymer covering the whole tissue was applied and incubated at room temperature for 45 minutes.

11. Washing was done in TBS buffer [Tris buffer saline] for 5 minutes [4 changes].

12. One drop of substrate DAB [3, 3- Diaminobenzidine] solution was applied on each slide covering the whole material and incubated for 10-15 minutes, then washed in deiodinized water.

13. Hematoxylin was applied for few seconds and washed under running water.

14. Then it was dried and dehydrated in alcohol and incubated for 2 minutes.

15. It was mounted in DPX [distyrenedibutyl phthalate xylene]

Immunohistochemistry-ventana benchmark gx procedure (automatic)

IHC staining of slides prepared from formalin fixed paraffin embedded tissue (FFPET) on the BenchMark Classic Automated system (from Ventana). Sections from FFPET biopsies were cut using the microtome at 3-4micron thickness and mounted onto SuperFrost Plus slides. For each slide, Ventana labels were then printed which included a unique barcode containing all protocol information. The slides were then loaded onto the BenchMark carousel and read by the Ventana Barcode Reader. The automated Benchmark system put the slides through a series of userdefined de-paraffinization and antigen retrieval steps before commencing with the antibody staining. The primary antibody was either applied automatically if in a pre-diluted dispenser or 56

otherwise manually titrated onto the slide. The pre-diluted dispensers of the ultraView Universal DAB Detection Kit then provided all reagents required for staining. The counterstain and post-counterstain comprised Hematoxylin [cat #760-2021] and bluing reagent [cat #760-2037].

STATISTICAL ANALYSIS

Data was described in terms of range, mean, median, frequencies (number of cases) and relative frequencies (percentages).

OBSERVATIONS AND RESULTS

The present 1.5 years prospective study from 15th September 2022 to 14th March 2024 on Histopathological spectrum of urinary bladder biopsies was conducted in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana.

All urinary bladder biopsies and cystectomy specimens received over a period of 1.5 years were analyzed with reference to light microscopic findings and classified according to WHO Classification of Tumours of the Urinary System and Male Genital Organs [53] (year 2016).All the cases were also correlated with urine cytology findings, cystoscopy findings, clinical presentation and personal history of the patients wherever available. A total of 26,012 specimens were received during this study period, out of which 132 were urinary bladder biopsies constituting 0.5 % of all specimens.

Table 1- Age distribution of urinary bladder specimens

Age group (years)	No. of cases(n=132)	% age
0-10	1	0.7
11-20	1	0.7
21-30	2	1.5
31-40	4	3.0
41-50	17	12.8
51-60	27	20.4
61-70	46	34.8
71-80	28	21.2
81-90	5	3.7
91-100	1	0.7

In the present study, age of presentation ranged from 5 to 92 years. However, maximum cases (46/132; 34.8%) were in 7^{th} decade of life, with mean age of 61.3 years. The youngest patient was 5 years and oldest was 92 years old. There was 1 case each in 1^{st} and 10^{th} decade of life.

Table 2- Distribution of cases according to sex

Sex	No. of cases(n=132)	% age
Males	103	78
Females	29	22

Out of 132 cases, 103 were males accounting for 78% of patients and 29 were females accounting for 22% of all cases. Male: Female ratio was 3.5:1.

Personal history

Out of 132 cases, 36 patients were chronic smokers, 11 had history of alcohol intake. One patient was a post operative case of carcinoma vagina, post chemotherapy and radiotherapy, another patient was a known case of HBV infection, 1 patient was on anti-tubercular therapy. One patient was a known case of Rhabdomyosarcoma.

Clinical Presentation

Most of the patients presented with multiple complaints. Most common clinical presentation was hematuria (96/132;72.7%) followed by painful micturition (21/132;15.9%), increased frequency (14/132; 10.6%) and decreased urine output (12/132;9.0%).

Urine Cytology

Out of 132 cases, 79patients (59.8%) had got urine cytology examination done. Urine cytology examination was done according to The Paris System for Reporting Urinary Cytopathology and cases were divided into 6 categories. Category 1- Non-diagnostic/ Unsatisfactory

Category 2- Negative for High-grade urothelial carcinoma

Category 3- Atypical urothelial cells

Category 4- Suspicious for high-grade urothelial carcinoma

Category 5- High-grade urothelial carcinoma

Category 6- Low-grade urothelial carcinoma

Table 3- Urine cytological and histopathological correlation

Cytology diagnosis	No. of cases (n=79)	Histological diagnosis
Category 2	61	36-Non-invasive papillary urothelial carcinoma, low grade 12-Infiltrating urothelial carcinoma, high grade 4-Infiltrating urothelial carcinoma, low grade 2-Non-invasive papillary urothelial carcinoma, high grade 1-Leiomyosarcoma
Category 3	11	7-Infiltrating urothelial carcinoma, high grade 2-Non-invasive papillary urothelial carcinoma, low grade 1-Infiltrating urothelial carcinoma, low grade 1-Non-invasive papillary urothelial carcinoma, high grade
Category 4	5	3-Infiltrating urothelial carcinoma, high grade 2-Non-invasive papillary urothelial carcinoma, high grade
Category 5	2	Non-invasive papillary urothelial carcinoma, low grade and infiltrating urothelial carcinoma, high grade

In our study, 61 cases were reported as Negative for High Grade Urothelial Carcinoma- Category 2 (61/79; 77.2%), followed by 11cases of Atypical Urothelial Cells- Category 3 (11/79; 13.9%). Five cases were reported as Suspicious for High Grade Urothelial Carcinoma- Category 4 (5/79; 6.3%) and 2 cases as High Grade Urothelial Carcinoma- Category 5 (2/79; 2.5%).

Positive predictive value for detection of high grade urothelial carcinoma on histopathology in our study was 100% while the negative predictive value was 9.8%.

Table 4- Distribution of types of specimens

Type of specimen		No. of specimens (n=132)	%age
TURBT biopsies		122	92.4
Partial cystectomy		1	0.8
Radical cystectomy	With prostatectomy	8	6.8
	With hysterectomy	1	

In the present study, there were 132 urinary bladder biopsies, out of which 122 (122/132; 92.4%) specimens were received as TURBT biopsies followed by Radical cystectomy (9/132; 6.8%) and Partial cystectomy (1/132; 0.8%).Partial cystectomy was done in a 68 year old male who had a diverticular growth on posterior wall and it was reported as Leiomyosarcoma with chondroid differentiation.

Table 5- Cystoscopic location of growth in urinary bladder

Predominant site of growth	No. of cases(n=113)	% age
Anterior wall	17	15.0
Posterior wall	18	15.9
Right lateral wall	31	27.4
Left lateral wall	35	30.9
Dome	8	7.0
Base	4	3.5

In the present study, location of the tumours was more on the left lateral wall (35/113; 30.9%)followed by the right lateral wall (31/113;27.4%). However, most of the cases had growths on multiple sites.

Table 6- Types of growths in cystectomy specimens

Type of growth	No. of cases(n=10)	% age
Papillary	6	60
Ulceroproliferative	3	30
Sessile	1	10

Outof10 cystectomy specimens, 6 cases (60%) had a papillary growth, followed by 3 cases (30%) which had an ulceroproliferative growth and sessile growth was seen in 1case (10%). The size of the growths varied from minimum of 2 cm to largest measuring 7.5 cm.Lymph nodes were sent separately in 7 cases with a minimum number of 3 and maximum of 15.

Table 7 – Size of Transurethral resection of urinary bladder tumour specimens

TURBT specimen size (cm)	No. of cases(n=122)	% age
0-1	39	31.9
1-2	43	35.2
2-3	21	17.2
3-4	8	6.5
4-5	6	4.9
>5	5	4.0

The size of transurethral resection of bladder tumour specimens varied from 0.1 cm being the smallest to 7.2 cm being the largest. Maximum cases had size in the range of 1-2 cm (43/122; 35.2%) followed by 0-1 cm (39/122; 31.9%).

Table 8- Histopathological spectrum of urinary bladder lesions

Lesions		No. of cases(n=132)	% age
Non-neoplastic		19	14.4
Neoplastic	Non-invasive urothelial lesions	66	85.6
	Infiltrating urothelial carcinoma	46	
	Mesenchymal tumors	1	

Of the 132 cases, maximum were neoplastic lesions constituting 113 cases (113/132; 85.6%) followed by 19 cases (19/132; 14.4%) of non-neoplastic lesions. Neoplastic conditions included Non-invasive urothelial lesions, Infiltrating urothelial carcinoma and mesenchymal tumor. Non-neoplastic conditions included chronic cystitis, cystitis glandularis, granulomatous cystitis, eosinophilic cystitis, hemorrhagic cystitis and ulcer, non-specific.

Table 9- Non-neoplastic lesions

Non-neoplastic lesions	No. of cases(n=19)	% age
Chronic cystitis	12	63.1
Cystitis glandularis	2	10.5
Granulomatous cystitis	1	5.2
Eosinophilic cystitis	1	5.2
Hemorrhagic cystitis	1	5.2
Ulcer, non-specific	1	5.2
Blood clot	1	5.2

Among the non-neoplastic conditions, chronic cystitis had 12 cases (12/19; 63.1%) followed by 2 cases (2/19; 10.5%) of cystitis glandularis and 1 case (1/19; 5.2%) each of granulomatous cystitis, eosinophilic cystitis, hemorrhagic cystitis, ulcer, non-specific and blood clot.

There were 12 cases (12/19; 63.1%) of chronic cystitis which revealed focal ulceration of the urothelium with sub epithelium having fibrosis and dense infiltration by mononuclear inflammatory cells seen as lymphocytes and plasma cells. One patient was a known case of Rhabdomyosarcoma, post chemotherapy. Biopsy showed extensive areas of necrosis and hemorrhage with many dilated and congested blood vessels along with infiltration by mononuclear inflammatory cells. Many hemosiderin laden macrophages were noted- Therapy induced changes. No viable tumour cells were identified.

There were 2 cases (2/19;10.5%) of cystitis glandularis. On histopathological examination, there was focal proliferation of the basal layer of urothelium which formed von Brunn nests within lamina propria. These nests had a central cystic area. Few of the cystic areas were filled with secretions. The cells lining the cyst had a glandular appearance. Hence, diagnosis of cystitis glandularis was made.

In granulomatous cystitis, lamina propria showed a dense inflammatory granulation, acute and chronic along with many well-formed epithelioid cell granulomas with langhans and foreign body giant cell reaction. There was no caseation necrosis/fungal hyphae/spores seen. 20% ZN stain for AFB was negative. PAS and GMS stain for fungus was negative.

In solitary case of eosinophilic cystitis, there were foci of epithelial erosion with hemorrhage, necrosis and dense acute and chronic inflammatory infiltrate with marked prominence of eosinophils. Focal reactive changes of the epithelium were seen.

In hemorrhagic cystitis, normal urothelial lining was noted. Subepithelium showed marked congestion.

Single case (5.2%) of ulcer, non-specific urinary bladder was reported. On histopathological examination, there were extensive areas of ulceration with hemorrhage, necrosis and florid inflammatory granulation- acute and chronic seen as neutrophils, lymphocytes and plasma cells along with many histiocytes. No epithelioid cell granuloma was noted. PAS stain for fungus was negative.

One biopsy taken from urinary bladder showed blood clot only. No mucosa/ tumor cells were seen.

Table 10- Distribution of neoplastic lesions of urinary bladder

Category	No. of cases(n=113)	% age
1.Urothelial tumours		
-Infiltrating urothelial carcinoma	46	40.7
• Infiltrating urothelial carcinoma	43	38.0
• Infiltrating urothelial carcinoma with divergent differentiation	3	2.7
-Non-invasive urothelial lesions	66	58.4
• Papillary urothelial carcinoma, low grade	50	44.2
• Papillary urothelial carcinoma, high grade	12	10.6
• Papillary urothelial neoplasm of low malignant potential	4	3.6
2.Mesenchymal tumours		
Leiomyosarcoma	1	0.9

Out of the total 113 cases of urothelial tumours, 66 cases (66/113; 58.4%) were of Non-invasive urothelial lesions. Out of these 66 cases, 50 (44.2%) were Papillary urothelial carcinoma, low grade, followed by 12 cases (10.6%) of Papillary urothelial carcinoma, high grade and 4 cases (3.6%) of Papillary urothelial neoplasm of low malignant potential.

Papillary urothelial carcinoma is a papillary urothelial neoplastic proliferation with some cytologic and architectural atypia visible at low to intermediate magnification. Non-invasive papillary urothelial carcinoma has thin fibrovascular cores lined by neoplastic epithelium >

7 cells thick. Non-invasive papillary urothelial carcinoma, low grade constituted (50/113) 44.2% of all cases. These cases had delicate papillae with branching and lined by cells exhibiting an orderly appearance with some loss of polarity, mild nuclear irregularity and pleomorphism. Mitosis was seen rarely. Umbrella cells were present. One case of Non-invasive papillary urothelial carcinoma, low grade had focal high grade areas (>10%).

There were 12 cases (12/113;10.6%) of non-invasive papillary urothelial carcinoma, high grade in the present study. The papillae were fused or branching with predominant disordered arrangement with frequent loss of polarity. The cells showed nuclear pleomorphism with moderate to marked enlargement of cells. Multiple prominent nucleoli were seen. Mitosis was frequent and umbrella cells were absent.

There were 4 cases (4/113;3.6%) of Papillary urothelial neoplasm of low malignant potential which showed a tumor arranged in papillary architecture which was >7 cells thick. The cells were uniformly enlarged with absent to inconspicuous nucleoli and rare mitosis. Cytologically, they had a monotonous appearance with cells being identical to each other. Uniform distribution of chromatin was noted.

We had 46 cases (46/113; 40.7%) of Infiltrating urothelial carcinoma. These cases showed a variety of architectural patterns seen as trabeculae, nests or singly dispersed cells infiltrating the lamina propria. The cells exhibited moderate to marked nuclear pleomorphism with hyperchromatic nuclei and irregular nuclear contours. Numerous mitotic figures with atypical mitotic figures were noted. Three cases of Infiltrating urothelial carcinoma high grade showed lymphovascular and perineural invasion.

Out of 46 cases of infiltrating urothelial carcinoma, 3 cases (3/113; 2.7%) had a divergent differentiation, with 2 cases showing squamous differentiation and 1 with focal glandular differentiation. Histopathological examination of one case of infiltrating urothelial

carcinoma with squamous differentiation revealed cells arranged in papillae, sheets and nests which were infiltrating lamina propria as well as the muscularis propria included in the biopsy. The tumor cells had pleomorphic, hyperchromatic nuclei with moderate amount of cytoplasm. Occasional focus of individual cell keratinization was noted and hence a diagnosis of Invasive papillary urothelial carcinoma, high grade with squamous differentiation was made.

Similarly, there was another case which showed tumor cells exhibiting marked nuclear pleomorphism. The tumor cells had hyperchromatic nuclei with moderate amount of vacuolated cytoplasm.A focal area of squamous differentiation was seen. Immunohistochemistry was done which revealed strong positivity for p16, patchy positivity for p40, p63, GATA-3, CK7 and CK20. Uroplakin was negative in tumor cells. So, diagnosis of Infiltrating urothelial carcinoma- high grade with focal squamous differentiation was given.

One case of infiltrating urothelial carcinoma showed glandular differentiation. On histopathological examination, the tumor cells were arranged in glandular configuration. These glands were lined by cells having hyperchromatic nuclei, inconspicuous nucleoli and moderate amount of cytoplasm. Atypical mitotic figures were also seen. Other areas showed morphology of infiltrating urothelial carcinoma, high grade.

Single case which was received as an outside block for opinion was given a diagnosis of Infiltrating urothelial carcinoma, possibly Plasmacytoid carcinoma and Immunohistochemistry was advised. The tumor cells were arranged in nests separated by thin fibrovascular septae and had vesicular nuclei with moderate cytoplasm. Few of the cells had eccentric nuclei and vacuolated cytoplasm. In addition, variable number of single cells with cytoplasmic vacuoles, imparting an appearance of signet ring cells were seen. Invasion of lamina propria and muscularis propria by the tumor cells was noted.

Solitary case of mesenchymal tumor (1/113; 0.9%) was provisionally diagnosed as malignant spindle cell neoplasm and after Immunohistochemistry a diagnosis of Leiomyosarcoma with chondroid differentiation was given. On histopathological examination, the tumor cells were spindle shaped, had cigar shaped vesicular nuclei and moderate amount of eosinophilic cytoplasm. Cytological atypia with brisk mitosis were noted. Also seen were bits of cartilage with presence of chondrocytes within myxoid stroma. On Immunohistochemistry the spindle cells were immunopositive for SMA, Desmin and H Caldesmon. CK was positive in urothelial lining and S100 in areas of chondroid differentiation. MIB-1 was 60% in highest proliferating areas.

Immunohistochemistry was done in 3 cases, one case was of a 68 year old male who underwent cystectomy, was initially given a provisional diagnosis of malignant spindle shaped neoplasm. IHC revealed tumor cells expressing SMA, Desmin and H Caldesmon while chondroid areas expressed S-100. So it was reported as Leiomyosarcoma with chondroid differentiation. Other case was of a 63 year old male who underwent radical cystectomy. Provisional diagnosis of Infiltrating carcinoma, possibly urothelial was given. On Immunohistochemistry, p63, GATA-3 and CK7 were positive in tumor cells while Uroplakin-2, CK20 and CK5/6 were negative in tumor cells. So, it was diagnosed as Infiltrating urothelial carcinoma.

Third case was of a 58 year old femaleprovisionally diagnosed as Infiltrating carcinoma possibly Urothelial. On immunohistochemistry, tumor cells were strong positive for p16, patchy positive for p40, p63, GATA-3, CK7 and CK20. Uroplakin was negative in tumor cells. Hence, a final diagnosis of Infiltrating urothelial carcinoma- high grade with focal squamous differentiation was given.

Table 11- Distribution of Infiltrating urothelial carcinoma

Infiltrating urothelial carcinoma	No. of cases(n=46)	% age
Low grade	6	13.1
High grade	40	86.9

Infiltrating urothelial carcinoma was further divided into low grade and high grade, with 6 cases (6/46;1 3.1%) of infiltrating urothelial carcinoma, low grade followed by 40 cases (40/46;86.9%) of infiltrating urothelial carcinoma, high grade.

Table 12–Invasion of Detrusor muscle in Infiltrating urothelial carcinoma

Histological grade	Detrusor muscle invasion
Infiltrating urothelial carcinoma, low grade	1(1/6; 16.6%)
Infiltrating urothelial carcinoma, high grade	12(12/40; 30%)

Out of 6 cases of infiltrating urothelial carcinoma, low grade, only one case(1/6; 16.6%) had invasion into Detrusor muscle, while 12 cases (12/40; 30%) out of 40 cases of infiltrating urothelial carcinoma, high grade showed invasion into Detrusor muscle.

TNM Staging

There were 10 cystectomy specimens which were given TNM staging according to AJCC 8TH Edition.[115]

One case was of non-invasive papillary urothelial carcinoma, low grade and hence given stage Ta.Invasion of lamina propria(T1) was seen in 1 case (12.5%), invasion of muscularis propria(T2) in 1 case (12.5%), invasion of perivesical soft tissue(T3) in 3 cases (37.5%) and invasion of adjacent structures(T4) in 3 cases (37.5%) with 2 cases having infiltration into the prostate and the third one involved the soft tissue resected margins and right seminal vesicle. One case was of

leiomyosarcoma with chondroid differentiation, which was staged according to soft tissue CAP Protocol and was given stage pT1.

Two cases had metastasis in multiple regional lymph nodes and were given category pN2while in other cases there was no lymph node metastasis and were given stage N0.Distant metastasis could not be determined from the submitted specimens so category pM not applicable was given.

DISCUSSION

One of the primary causes of cancer-related mortality is neoplasms of the urinary bladder. They have a high rate of morbidity and mortality despite tremendous progress in understanding their genesis and in developing better techniques for diagnosis and treatment. Histopathology is the most effective method for predicting the course, chance of recurrence, and responsiveness to treatment of bladder cancer.[116]Consequently, a pathologist is crucial in providing not just the diagnosis but also any other information that may affect the course of treatment.[117]A wide range of histological findings and lethal behaviors characterize urinary bladder cancer, an intricate and heterogeneous disease. Patients with muscle invasive carcinoma experience disease progression, recurrence, and ultimately death despite advancements in surgical procedures and intravesical and systemic therapy.[118] Cystoscopy, histopathology, and urine cytology are used in combination to diagnose and track bladder tumours. Histopathology is still essential for both diagnostic and therapeutic purposes, though. Excluding muscle fibres during a cystoscopic biopsy may result in inaccurate tumour staging and histological grading. The majority of the time, these issues are preventable by researching serial sections, employing particular stains and by inclusion of the muscle layer during cystoscopic biopsy. Robust methods for accurately classifying and predicting bladder tumors are employed in the modern era, including flow cytometry, chromosomal analysis, genomics, proteomics, and immunohistochemistry (IHC) applications.[119] However, these methods are not frequently employed because they lack sensitivity and specificity and are extremely expensive and unavailable to the general public.

The present 1.5years study from 15th September 2022 to 14thMarch 2024 on Histopathological spectrum of urinary bladder biopsies was conducted in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana.All urinary bladder biopsies and cystectomy specimens received were included in the study. A total of 26,012

specimens were received during this study period, out of which 132 were urinary bladder biopsies constituting 0.5 % of all specimens.

In the present study, there were 132 urinary bladder biopsies, out of which 122 (92.4%) were received as transurethral resection of urinary bladder tumour (TURBT) specimens followed by radical cystectomy (9 cases; 6.8%) and partial cystectomy (1 case; 0.7%). In a study conducted by Priyamvada et al [112], retrospective data for 10 years was collected, of which 271 patients were evaluated. Of these, 18 biopsies were inadequate, 1 showed no specific pathology and in 252 cases, a provisional diagnosis was made. Out of these 252 cases, 242 (96%) were TURBT biopsies followed by 10 cases (4%) of radical cystectomy. In another study by ReetiPokar et al [113], 58 cases were studied retrospectively over a period of 2 years. Of these 58 cases, 53 (91.4%) were Transurethral Resection of bladder tumor biopsies followed by 5 cases (8.6%) of radical cystectomy. Hence, our findings are similar to these 2 studies where majority of urinary bladder biopsies were received as TURBT specimens.

The age of patients in our study ranged from 5 to 92 years, with a mean age of 61.3 years with (46/132) 34.8% of patients in age group of 61-70 years. Male: female ratio was 3.5:1 which is analogous to the study done by Jhaveri PN et al[104] and PreethamolS et al[110]. Jhaveri PN et al [104] reported 27.0% of patients between the ages of 60-69 years and males were more frequently affected as compared to females. Preethamol S et al [110] reported 62.6% cases between the age group of 61-80 years and males were more frequently affected similar to our study. Higher incidence of bladder cancer in men may be because of habit of cigarette smoking and industrial exposure to acrylamine, schistosoma haematobium, cyclophosphamide, artificial sweeteners and long acting analgesics. The exact mechanism is unclear but cytogenetics and molecular alterations are heterogenous.

Urine cytology functions as the primaryscreening modality for the detection of urothelial neoplasms. Although neoplastic urothelial cells

were initially recognized in urine in 1864, it was not until 1945 that Papanicolaou and Marshall described the utility of urine cytology in diagnosis of urothelial malignancy. Subsequent to this, there have been many studies evaluating the diagnostic yield of this method.

In our present study, urine cytology findings were available in a total of 79 cases out of the total 132 cases. Of these, 2 cases were categorized as High grade urothelial carcinoma, category 5. Of the remaining cases, 77.2% were reported as Negative for high grade urothelial carcinoma, category2, 13.9% as atypical urothelial cells, category 3 and 6.3% as suspicious for high grade urothelial carcinoma, category 4. Two cases reported as High grade urothelial carcinoma, category 5 on urine cytology were non-invasive papillary urothelial carcinoma, low grade and infiltrating urothelial carcinoma, high grade on histopathology. Five cases were reported as Suspicious for high grade urothelial carcinoma, category 4 on urine cytology, out of which 2 cases were given a diagnosis of non-invasive papillary urothelial carcinoma, high grade and 3 cases as infiltrating urothelial carcinoma, high grade. Atypical urothelial cells, category 3 was given on urine cytology in 11 cases, of which 7 cases were histologically diagnosed as infiltrating urothelial carcinoma, high grade, 2 cases as non-invasive papillary urothelial carcinoma, low grade and 1 case each of non-invasive papillary urothelial carcinoma, high grade and infiltrating urothelial carcinoma, low grade. Sixty one cases were reported as reported as negative for high grade urothelial carcinoma on urine cytology, category 2 of which, 36 cases were reported as non-invasive papillary urothelial carcinoma, low grade, 12 cases infiltrating urothelial carcinoma, high grade, 5 cases chronic cystitis, 4 cases of infiltrating urothelial carcinoma, low grade, 2 cases as non-invasive papillary urothelial carcinoma, high grade and 1 case each of leiomyosarcoma and eosinophilic cystitis. Positive predictive value for detection of high grade urothelial carcinoma on histopathology in our study was 100%, while the negative predictive value (NPV) was found to be only 9.8%.

In another study by M Sumathi [120], 160 urine cytology samples were received, of which 20 cases were reported as negative for high grade urothelial carcinoma, category 2. On histopathology, of these 20 cases, 11 cases were reported as infiltrating urothelial carcinoma, 7 cases were reported as cystitis, 1 case as tuberculous cystitis. Category 3, Atypical urothelial cells on cytology was given in 10 cases and after histopathology, 2 cases were benign neoplasms, 1 was leiomyoma and rest were benign. Forty one cases were reported as malignant on urine cytology, which after histopathology showed 35 cases of infiltrating urothelial carcinoma, high grade, 4 cases infiltrating urothelial carcinoma, low grade and single case of squamous cell carcinoma. In another study by Rai S et al [121], 13 cases were reported as positive for malignancy on cytology. Of these 13 cases, 8 cases were reported as infiltrating urothelial carcinoma, high grade and 5 cases as infiltrating urothelial carcinoma, low grade. Eighteen cases which were reported as atypical urothelial cells, category 3, on histopathology revealed 2 cases of infiltrating urothelial carcinoma, high grade and 16 cases as suspicious for high grade urothelial carcinoma.

All the 5 cases reported as suspicious for high grade urothelial carcinoma, category 4 and 2 cases of high grade urothelial carcinoma, category 5 turned out to be urothelial carcinoma on histopathology. While a cytology report of negative for high grade urothelial carcinoma was not found to be useful in ruling out malignancy. One of the reasons for NPV of 9.8% could be that we analyzed a single urine sample in our study as compared to other studies where 3 urine samples of a patient were tested. Another reason could be the delay in transportation of urine samples leading to lysis of cellular material.

In our study the most common clinical presentation was hematuria (96/132;72.7%) followed by painful micturition (21/132;15.9%), increased frequency (14/132;10.6%) and decreased urine output (12/132;9.0%). This is comparable to the studies conducted by Reeti Pokar et al [113] and S Preethamol et al [110]. In the study by Reeti Pokar et al [113], the most common presenting symptom was hematuria

(91.4%) followed by increased frequency of micturition (32.8%), burning micturition (31%), dysuria (8.6%) and abdominal pain (6.9%). In a similar study by S Preethamol et al [110], hematuria was the most common clinical manifestation (99.5%), followed by increased frequency (57%), abdominal pain (44.6%), incomplete voiding (42.7%) and dysuria (42.0%).

In our study, (113/132) 85.6% cases were of neoplastic lesions followed by non- neoplastic lesions constituting (19/132) 14.4% of the total cases. In a study done by Sri kousthubha et al [101], 50% cases were non-neoplastic and 50% were neoplastic. In a study done by Suba J et al [105], 56.7% cases were neoplastic and 43.2% were non-neoplastic. A higher percentage of neoplastic lesions in our study can be attributed to the tertiary care nature of our institution.

Table 13 – Distribution of various non-neoplastic lesions

Non-neoplastic lesions	**Present study (n=19)**	**Sri kousthubhaet al**	**Suba J et al**
Chronic cystitis	63.1%	71.4%	51.7%
Cystitis glandularis	10.5%	4.7%	10.3%
Granulomatous cystitis	5.2%	14.2%	10.3%
Eosinophilic cystitis	5.2%	4.7%	6.9%
Hemorrhagic cystitis	5.2%	4.7%	3.5%
Ulcer, non-specific	5.2%	-	-
Blood clot	5.2%	-	-

In the present study, among the non-neoplastic conditions, (12/19) 63.1% cases were of chronic cystitis followed by (2/19) 10.5% cases of cystitis glandularis and 1 case (1/19;5.2%) each of granulomatous cystitis, eosinophilic cystitis, hemorrhagic cystitis, ulcer, non-specific and blood clot.In study by Sri kousthubha et al[101], majority of the cases were of chronic cystitis (71.4%) followed by 3 cases of tubercular cystitis (14.2%) and 1 case (4.7%)each of eosinophilic cystitis, hemorrhagic cystitis, follicular cystitis and cystitis glandularis. Similarly, in study by Suba J et al [105], 51.7% cases were of chronic cystitis followed by follicular cystitis (17.2%), granulomatous cystitis (10.3%), von Brunn's nests (10.3%), eosinophilic cystitis (6.9%) and hemorrhagic cystitis (3.5%). Hence, the findings of our study are concordant with other 2 studies as chronic cystitis was found to be the predominant non-neoplastic lesion of urinary bladder biopsies.

In our study, lateral walls of urinary bladder were most commonly involved by the tumor with left lateral wall involved in (35/113) 30.9% cases followed by right lateral wall in (31/113) 27.4% cases. In study by Sri kousthubha et al [101], most common affected area of the urinary bladder was the lateral wall (64%) and the least common affected sites were dome (4%) and ureteric orifice (4%). In study by Jhaveri et al [104], lateral wall the most common location of urinary bladder tumor followed by anterior wall (22%) and 13% cases involving posterior wall and bladder neck each. So, our findings are similar to the other studies in the literature.

All urinary bladder biopsies were classified according to WHO Classification of Tumours of the Urinary System and Male Genital Organs[53]. Because of the WHO/ISUP classification's many benefits, including its uniform language and common meaning that are approved by different urological pathologists, we chose it for the histological grading in the current investigation. It has clearly established criteria that increase inter-observer repeatability for both neoplastic and preneoplastic bladder tumours. Better cyto-histologic linkage is made possible by the similarity between urine cytology terminology and

WHO/ISUP categorization terminology. This avoids over diagnosing or under diagnosing urothelial tumours. It helps to identify a specific subset of patients for intravesical therapy who have high grade papillary urothelial carcinoma and carcinoma in situ. It eliminates vagueness from diagnostic classifications. It provides information on the survival rates, grade and stage of progression, and recurrence rate of several non-invasive bladder papillary urothelial neoplasms.[122]

Table 14 – Comparison of urothelial tumours of urinary bladder

Neoplastic lesions	Present study (n=113)	Sushmitha S et al	Priyamvada et al	Pokar Reeti et al
Infiltrating urothelial carcinoma	40.7%	62.8%	74.5%	91.6%
Papillary urothelial carcinoma, low grade	44.2%	17.1%	21%	-
Papillary urothelial carcinoma, high grade	10.6%	5.7%	10.5%	-
Papillary urothelial neoplasm of low malignant potential	3.6%	11.4	35.6%	1.7%

In the present study, papillary architecture was observed in case of non-invasive urothelial lesions with the papillae showing fusion and branching. These papillae were lined by >7 layers of urothelium. Non-invasive papillary urothelial carcinoma, low grade had an orderly appearance with some loss of polarity, mild nuclear irregularity and pleomorphism. Nuclear size was enlarged with minimal variation seen within and between cells. Nucleoli were inconspicuous. Mitosis was seen occasionally and umbrella cells were usually present. While non-

invasive papillary urothelial carcinoma, high grade cases had predominantly disordered maturation with frequent loss of polarity. The cells were enlarged with moderate to marked nuclear pleomorphism and multiple prominent nucleoli were seen. Mitosis was frequent and umbrella cells were not seen.

In case of infiltrating urothelial carcinoma, there were nests and sheets of tumor cells which were seen infiltrating lamina propria. The tumor cells had variably sized and shaped hyperchromatic nuclei with irregular nuclear contours. Evidence suggests that invasion pattern matters for prognosis; single cell patterns and infiltrative cords are associated with a worse prognostic profile.[123]

In the present study, out of 113(85.6%) cases of urinary bladder tumors, (66/113) 58.4% were non-invasive urothelial tumors followed by (46/113) 40.7% cases of Infiltrating urothelial carcinoma. Among non-invasive urothelial tumors, papillary urothelial carcinoma, low grade constituted (50/113) 44.2% cases followed by (12/113)10.6% cases of papillary urothelial carcinoma, high grade and (4/113) 3.6% cases of papillary urothelial neoplasm of low malignant potential.In a study conducted by Sushmitha S et al[111], invasive urothelial carcinoma accounted for 62.8% of total cases. Similarly, in a retrospective study done by Priyamvada et al[112], infiltrating urothelial carcinoma was seen in 74.5% cases.In another study done by Pokar Reeti et al[113], most common lesion was infiltrating urothelial carcinoma accounting for 91.6% cases. While in our study, non- invasive urothelial lesions were more as compared to other studies. The reason for this could be early presentation of the patient and hence early detection of the tumor. Early diagnosis is very important in diagnosing bladder cancer.

Significant divergent differentiation is a characteristic of urothelial cancer. Unlike primary adenocarcinoma or squamous cell carcinoma, a characteristic urothelial component must be present in these situations.

There is a greater chance of locally progressed illness in biopsy samples with squamous differentiation.[124]

The term "Invasive urothelial carcinoma with divergent differentiation" was added to the WHO's 2016 classification of tumours of the bladder. These tumours show elements of both alternative morphologies and the "usual type" of urothelial carcinoma [53].Squamoid, glandular, small cell, and trophoblastic differentiation are examples of the diverging morphology [125]. The urologist and oncologist should be aware of the significant prognostic or therapeutic implications of several of these variations. To prevent incorrect diagnoses, it is essential to be aware of these patterns.

In our study, there were 3 cases (3/113; 2.7%) of infiltrating urothelial carcinoma with divergent differentiation, with 2cases showing squamous differentiation and 1 case having glandular differentiation. In a study conducted by S Preethamol et al [110], out of total 21.6% cases of Infiltrating urothelial carcinoma,14.5% cases had squamous differentiation and 0.6% cases had glandular differentiation.In another study by Aparna et al [103], out of68.4% cases of neoplastic lesions,26.9% of infiltrating urothelial carcinoma showed squamous differentiation. Priyamvada Singhal et al [112] found 25.5% cases exhibiting divergent differentiation out of 118 cases of invasive carcinoma. There were 20.3% cases of squamous differentiation and 1.6% cases of glandular differentiation.

The most significant prognostic factors in urothelial cancer are muscle invasion and pathologic grade. In our present study, (40/46) 86.9% cases of infiltrating urothelial carcinoma were high grade while (6/46) 13.1% were infiltrating urothelial carcinoma, low grade. Our finding is concordant to the studies by Shah Anita et al[106] and Reeti Pokar et al[113]where infiltrating urothelial carcinoma, high grade comprised of 13.9% and 91.6% cases respectively.

In the present study, (1/6) 16.6% cases of infiltrating urothelial carcinoma, low grade had invasion into Detrusor muscle while (12/40)

30% cases of infiltrating urothelial carcinoma, high grade had invasion into Detrusor muscle. In another study by Jhaveri et al [104], 16.6% cases of infiltrating urothelial carcinoma, low grade showed invasion into Detrusor muscle and 88.8% of infiltrating urothelial carcinoma, high grade showed invasion into Detrusor muscle. Pokar Reeti et al [113], studied 62% cases of infiltrating urothelial carcinoma, out of which 33.3% cases of infiltrating urothelial carcinoma, low grade showed invasion into the Detrusor muscle while 74.1% cases of infiltrating urothelial carcinoma, high grade showed invasion into the Detrusor muscle. So, our findings are similar to these 2 studies where more cases of infiltrating urothelial carcinoma, high grade showed invasion of Detrusor muscle. Therefore, it is important to include smooth muscle in biopsy to prevent understaging of tumours.

Leiomyosarcoma is a rare mesenchymal tumour accounting for 1% of all bladder malignancies. In present study there was a solitary case (1/113; 0.8%) of leiomyosarcoma. In a study by S Preethamol et al[110], there were 2 cases of leiomyosarcoma. Patients with leiomyosarcoma have a poor prognosis and worse survival rates with increasing age.

SUMMARY AND CONCLUSION

This study was conducted in Dayanand Medical College and Hospital, Ludhiana, over a period of 1.5 years (15th September 2022 to 14th March 2024). A total of 132 urinary bladder biopsies were examined and analysed with reference to the light microscopic findings.

The following features were highlighted in this study:

- During the study period, a total of 26012 specimens were received for histopathological examination in our department. Out of these, 132 were urinary bladder biopsies constituting 0.5% of all specimens.
- The age of patients in our study ranged from 5 to 92 years with a mean age of 61.3 years. 34.8% cases were seen in the 7th decade of life.
- Males were more frequently affected as compared to females with a male: female ratio of 3.5:1.
- The most common clinical presentation was hematuria (72.7%).
- Most common specimen received was TURBT (92.4%) followed by radical cystectomy (6.8%) and partial cystectomy (0.8%).
- The most common location of growth in urinary bladder seen on cystoscopy was on the left lateral wall(30.9%) followed by right lateral wall(27.4%) and posterior wall(15.9%).
- Of the 132 cases, 85.6% were neoplastic lesions followed by 14.4% non-neoplastic lesions.
- Of the non-neoplastic lesions, 63.1% cases were of chronic cystitis followed by 10.5% cases of cystitis glandularis.
- Of the neoplastic lesions, 58.4% cases were non-invasive urothelial carcinoma followed by 40.7% cases of infiltrating urothelial carcinoma and single case (0.9%) of leiomyosarcoma.
- Of the non-invasive urothelial lesions, 44.2% of the cases were of papillary urothelial carcinoma, low grade followed by 10.6% cases of papillary urothelial carcinoma, high grade and 3.6% cases of papillary urothelial neoplasm of low malignant potential.

- Of the 40.7% cases of infiltrating urothelial carcinoma, 2.7% cases exhibited a divergent differentiation with 2 cases having squamous differentiation and 1 case showing glandular differentiation.
- 86.9% cases were of Infiltrating urothelial carcinoma, high grade followed by 13.1% cases of infiltrating urothelial carcinoma, low grade.
- In Infiltrating urothelial carcinoma, high grade, invasion of Detrusor muscle was seen in 30% cases.
- In Infiltrating urothelial carcinoma, low grade, invasion of Detrusor muscle was seen in 16.6% cases.
- Single case received as an outside block for opinion was of Infiltrating urothelial carcinoma, plasmacytoid carcinoma.
- Isolated case of mesenchymal tumour was seen which after Immunohistochemistry, was reported as Leiomyosarcoma with chondroid differentiation.
- Immunohistochemistry was done in 3 cases, one case was initially given a provisional diagnosis of malignant spindle cell neoplasm and after IHC was reported as Leiomyosarcoma with chondroid differentiation. Other 2 cases after IHC were reported as Infiltrating papillary urothelial carcinoma, high grade and other Infiltrating urothelial carcinoma, high grade with focal squamous differentiation.

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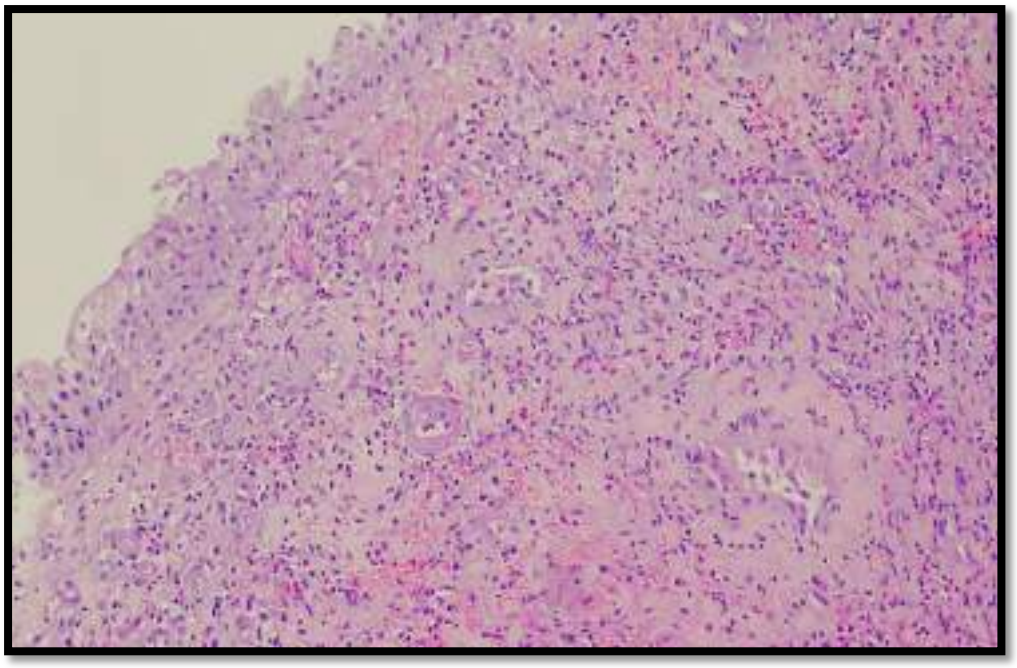
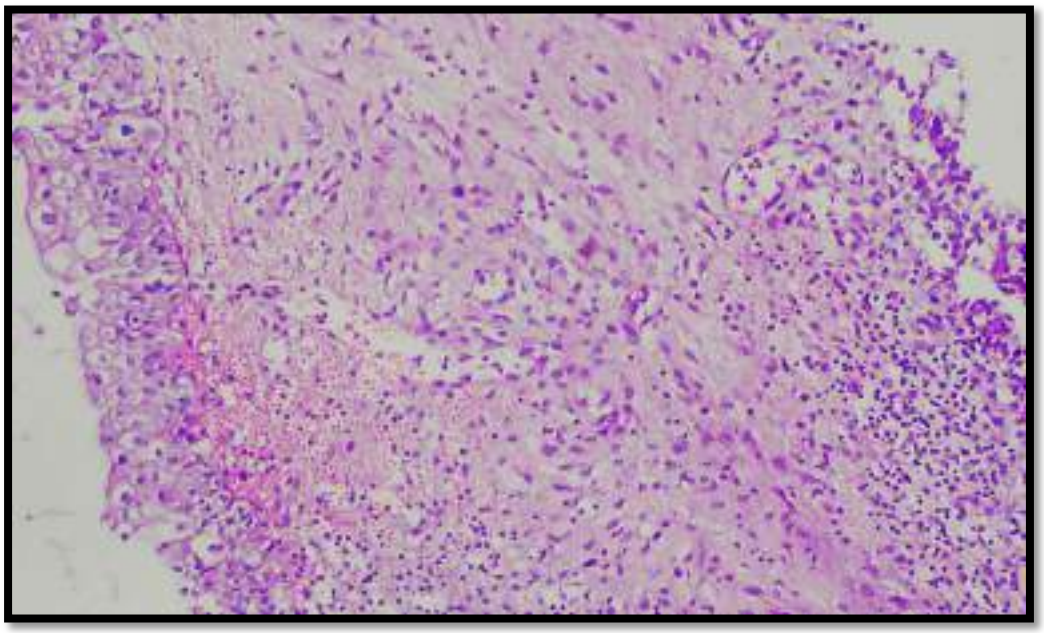
Picture 1- Gross image of cystectomy specimen with polypoidal growth visible on cut section on the anterior and posterior wall of urinary bladder.

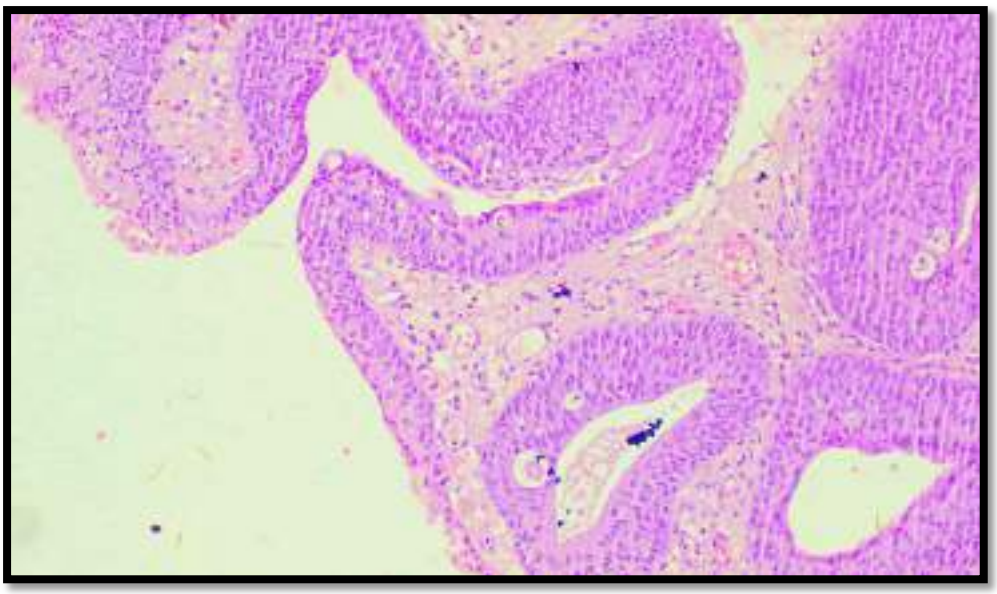
Picture 2- Gross image of cystectomy specimen with polypoidal growth visible on cut section filling whole of the lumen of urinary bladder.



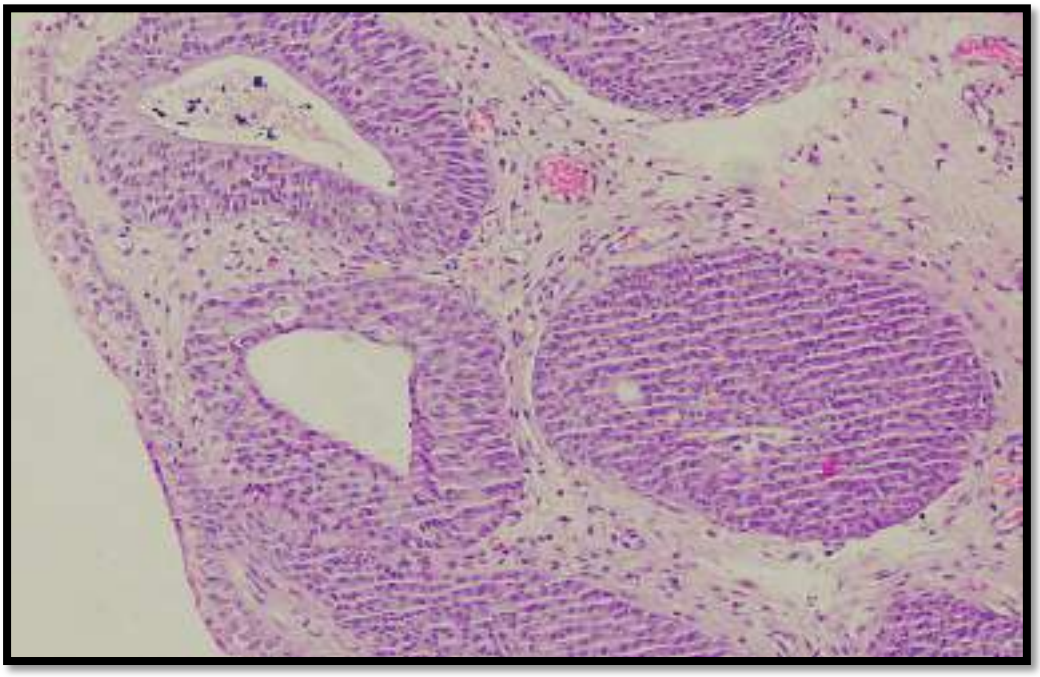
Picture 3- Photomicrograph of chronic cystitis showing infiltration of lamina propria by chronic inflammatory infiltrate (H&E, 100X)



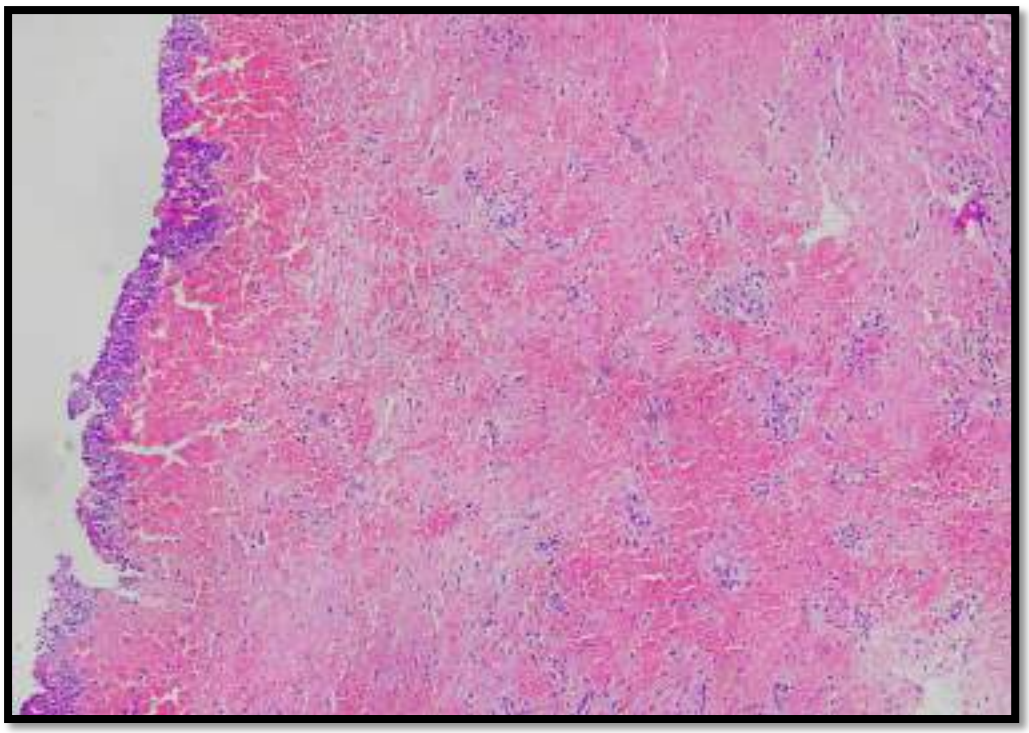
Picture 4- Photomicrograph of chronic cystitis showing subepithelium having dense infiltration by mononuclear inflammatory cells along with fibrosis (H&E, 100X)



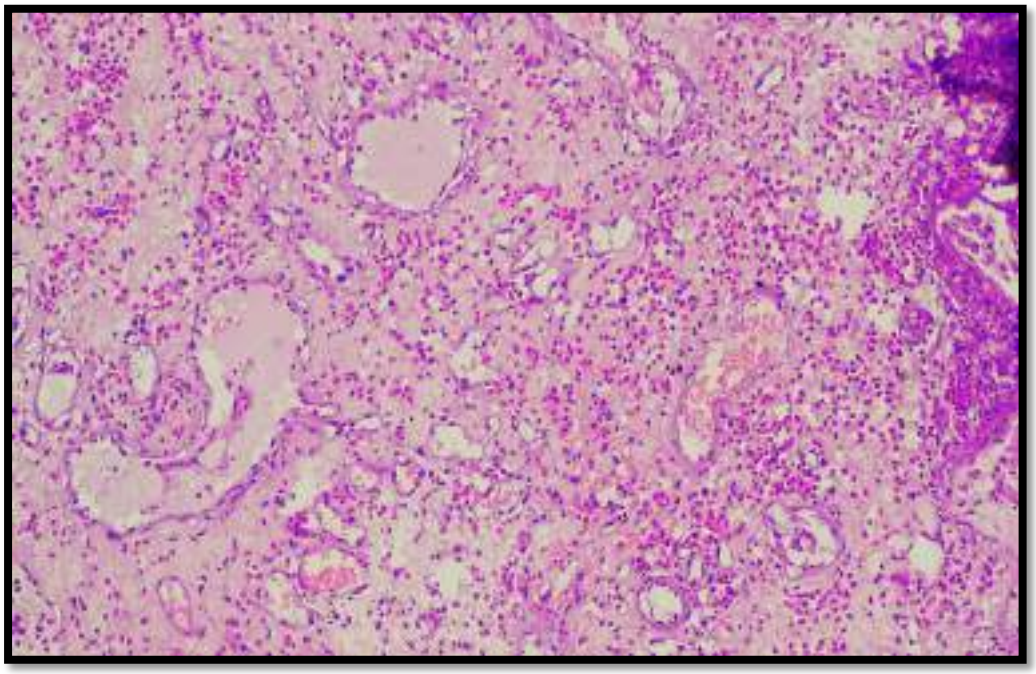
Picture 5- Photomicrograph of cystitis glandularis showing von Brunn nests within lamina propria with few having central cystic area (H&E, 100X)



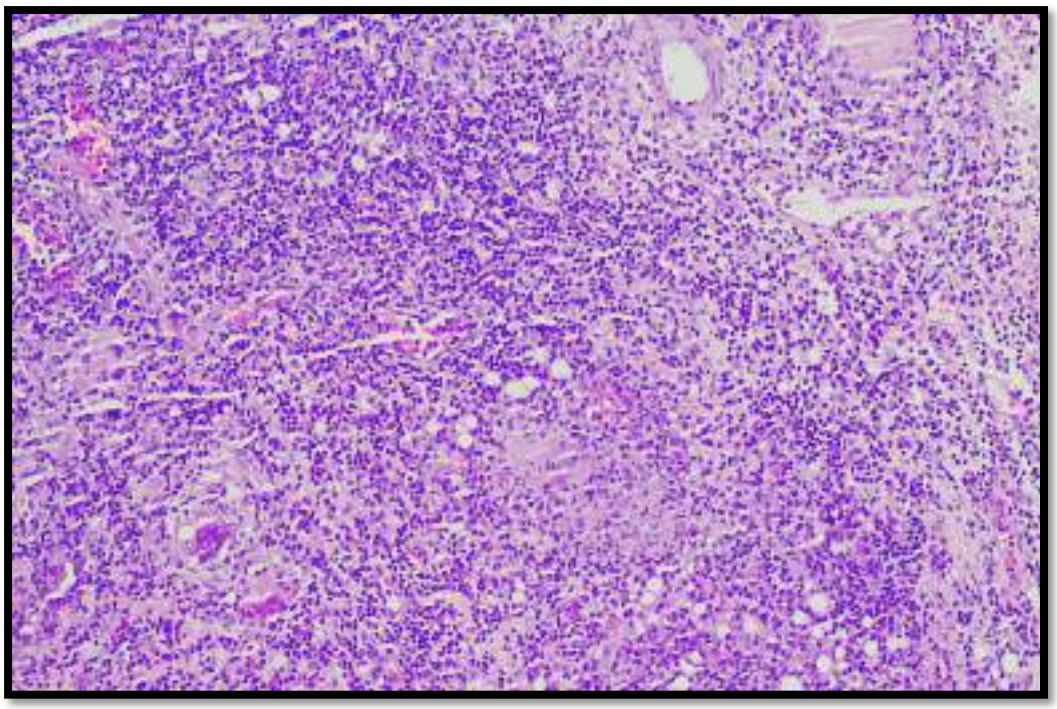
Picture 6- Photomicrograph of cystitis glandularis with gland like lumina in nests (H&E, 100X)



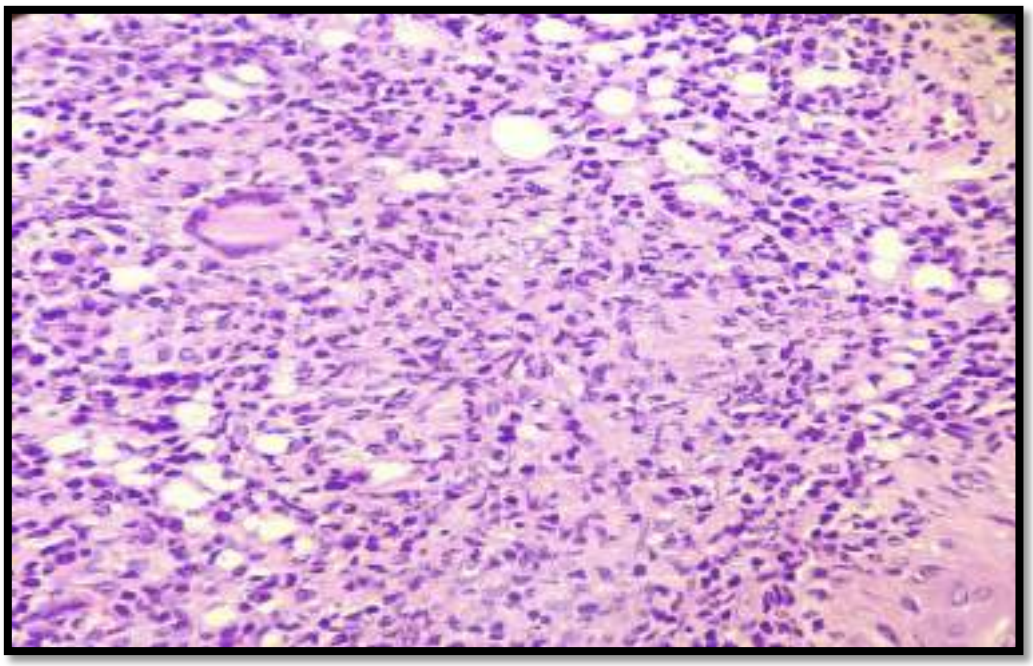
Picture 7- Photomicrograph of hemorrhagic cystitis showing normal urothelial lining with subepithelium having marked congestion (H&E, 100X)



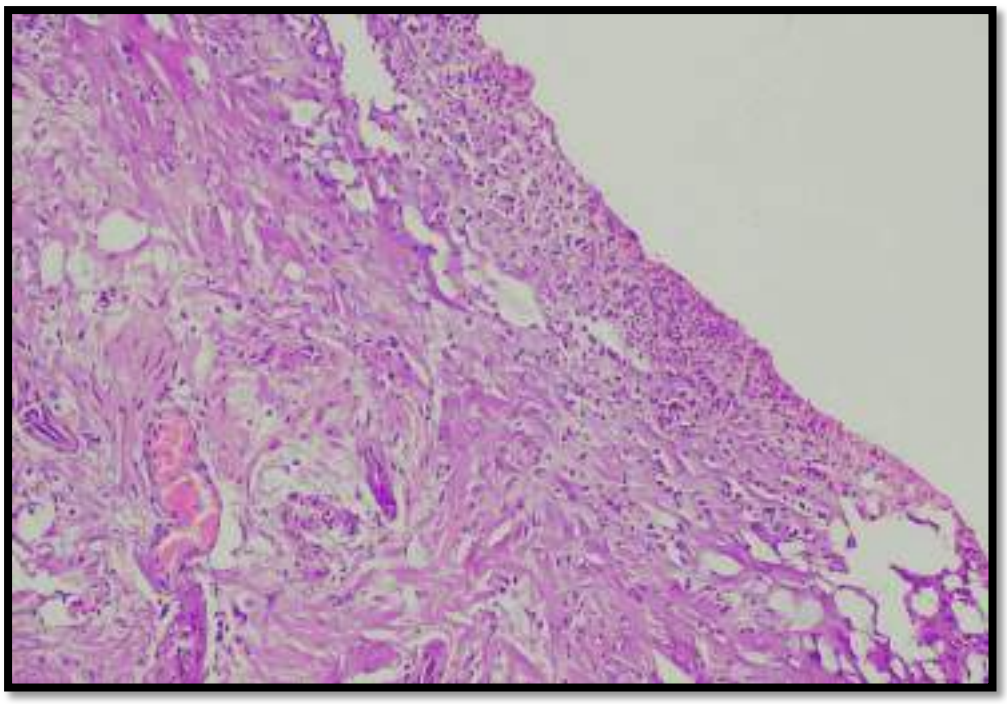
Picture 8- Photomicrograph of eosinophilic cystitis showing marked prominence of eosinophils within lamina propria (H&E, 100X)



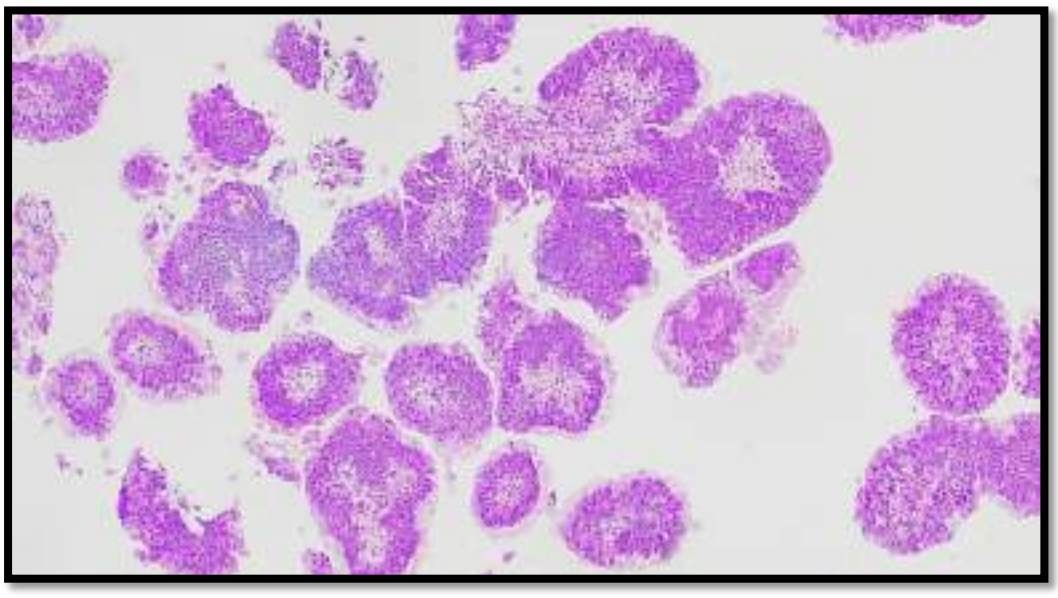
Picture 9- Photomicrograph of granulomatous cystitis showing dense inflammatory granulation, acute and chronic with many well formed epithelioid cell granulomas with langhans and foreign body giant cell reaction.(H&E, 100X)



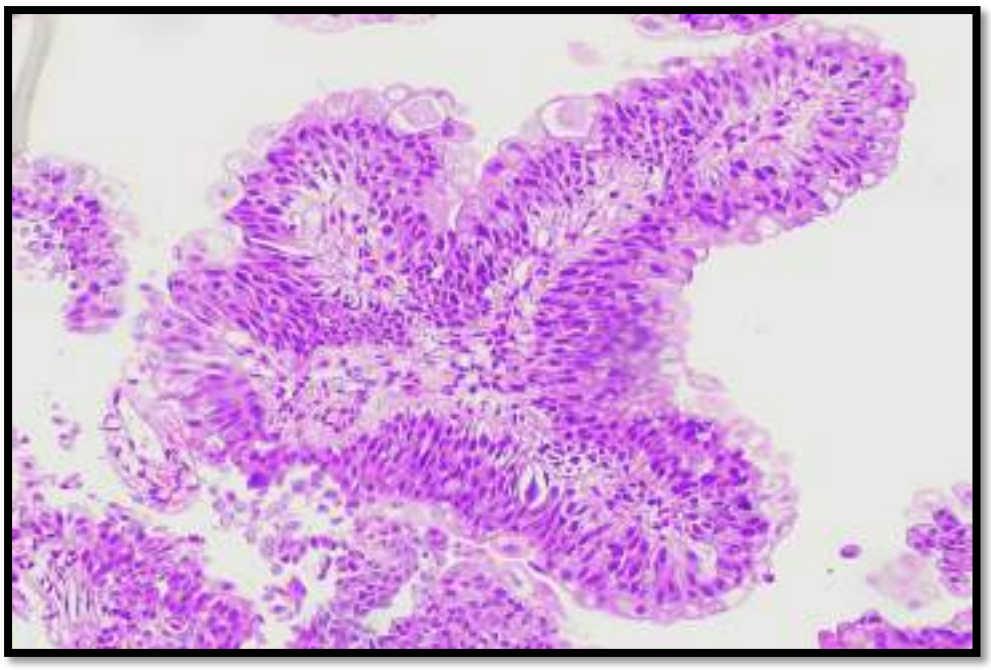
Picture 10– Photomicrograph of granulomatous cystitis showing epithelioid cell granuloma with multinucleated giant cells (H&E, 400X)



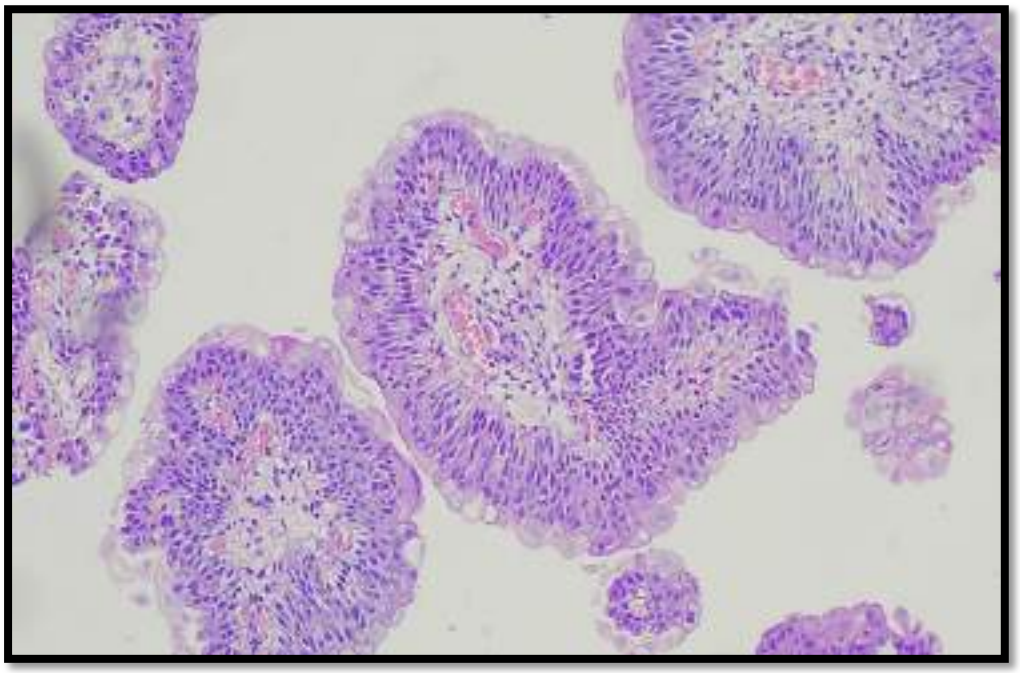
Picture 11- Photomicrograph of ulcer, non-specific showing extensive areas of mucosal ulceration with inflammatory granulation acute and chronic (H&E, 100X)



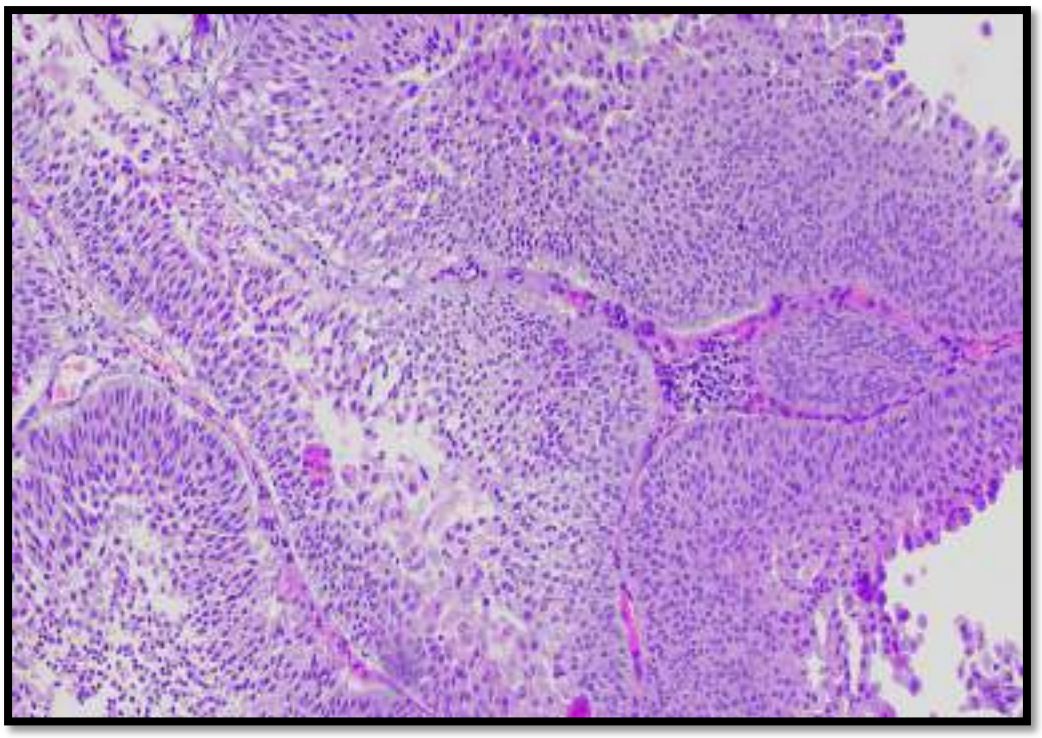
Picture 12- Photomicrograph of papillary urothelial neoplasm of low malignant potential showing delicate, occasionally fused papillae(H&E, 40X)



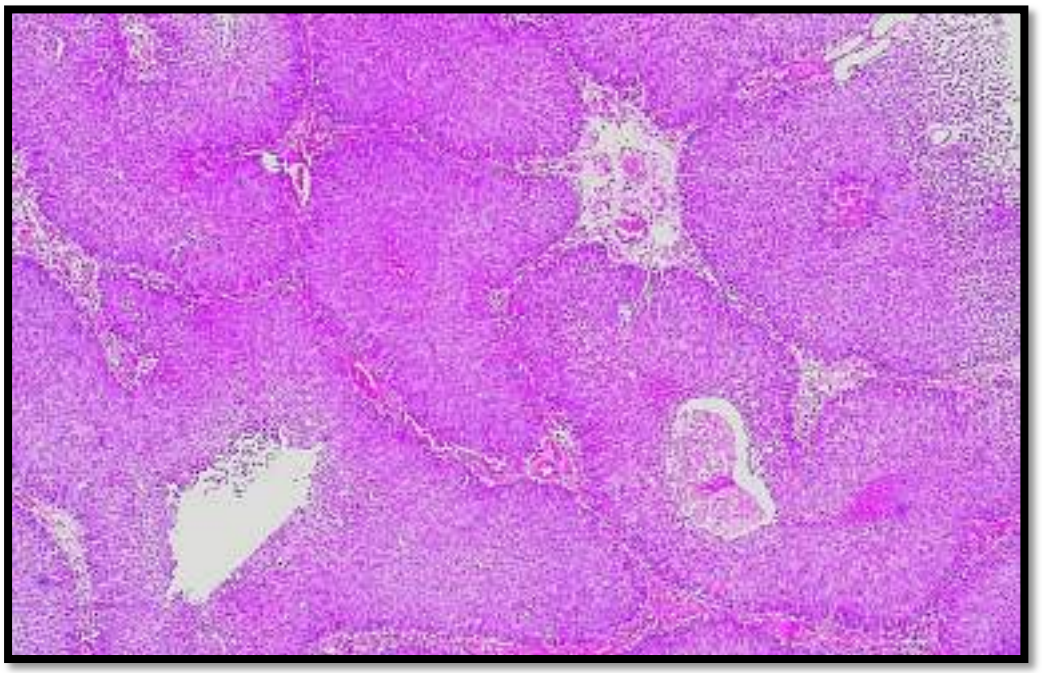
Picture13- Photomicrograph of papillary urothelial neoplasm of low malignant potential showing finger like growth pattern with increase in number of layers with no loss of polarity (H&E, 100X)



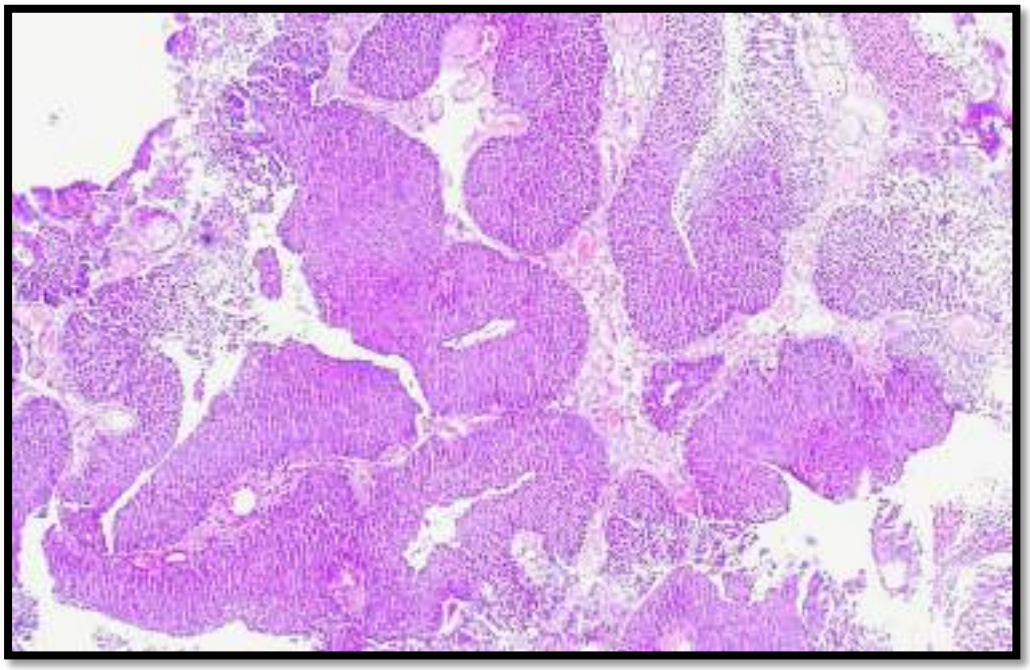
Picture 14- Photomicrograph of Papillary urothelial neoplasm of low malignant potential showing delicate papillae with thickened but orderly urothelial lining (H&E, 100X)



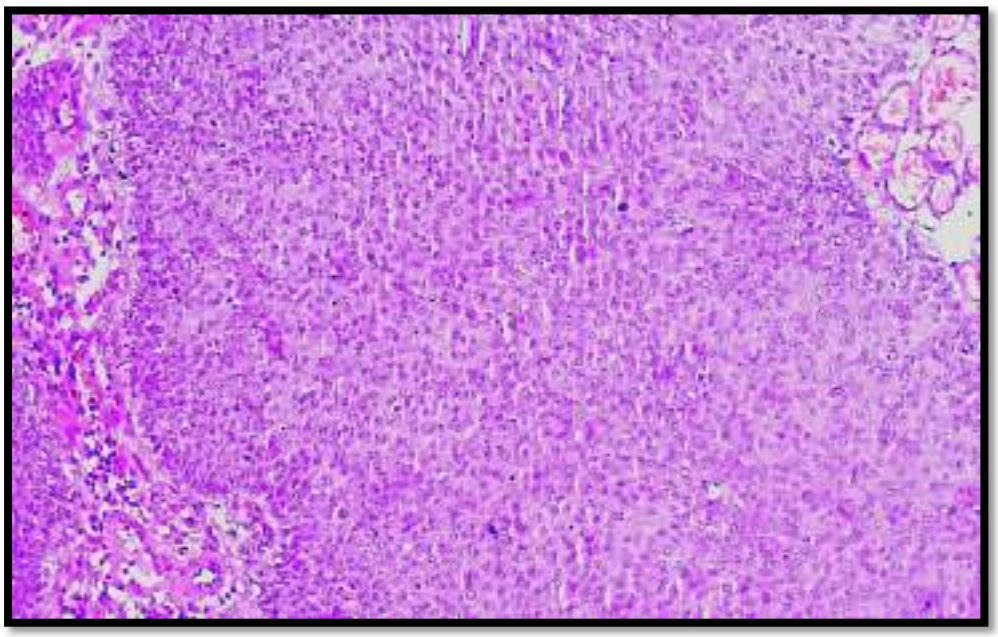
Picture 15 – Photomicrograph of non-invasive papillary urothelial carcinoma, low grade showing fused papillae (H&E, 100X)



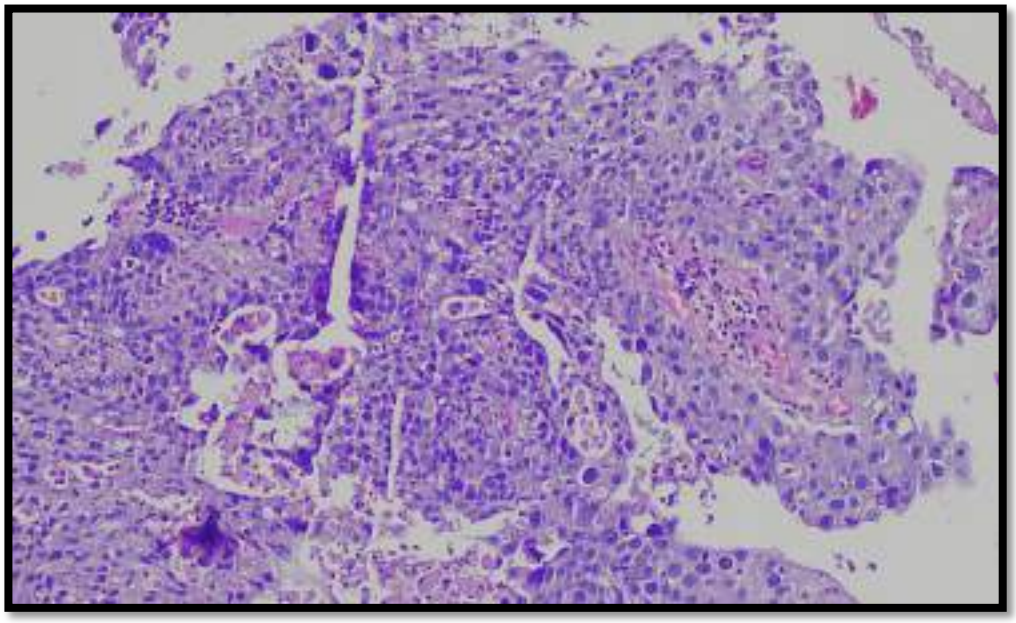
Picture 16– Photomicrograph of non-invasive papillary urothelial carcinoma, low grade showing fused papillae with thickened urothelium (H&E, 100X)



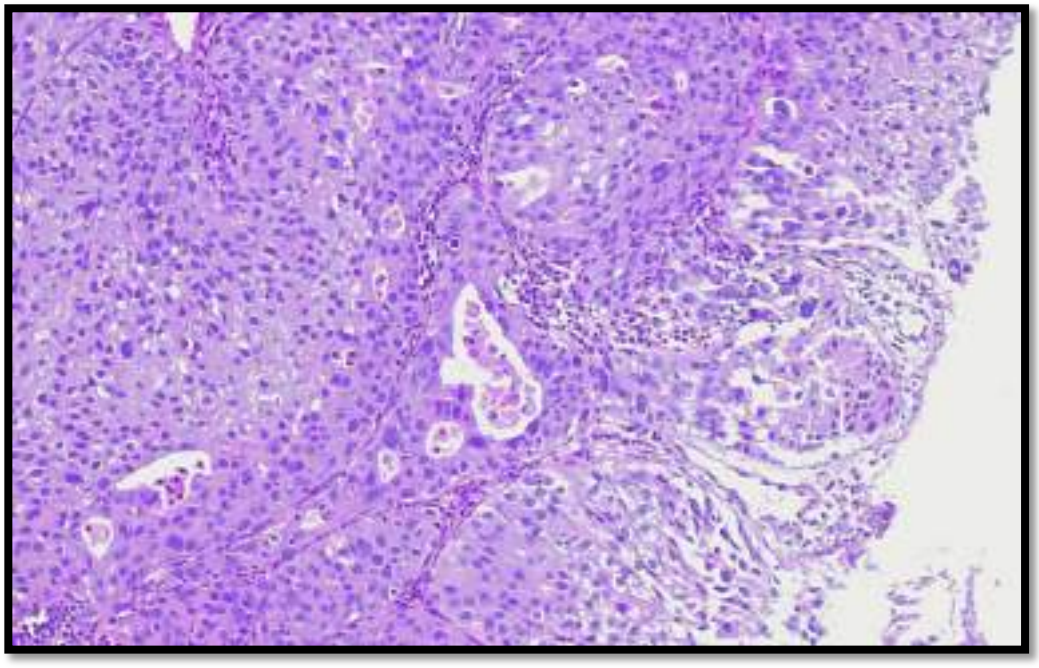
Picture 17– Photomicrograph of non-invasive papillary urothelial carcinoma, high grade showing fused papillae and loss of polarity(H&E. 100X)



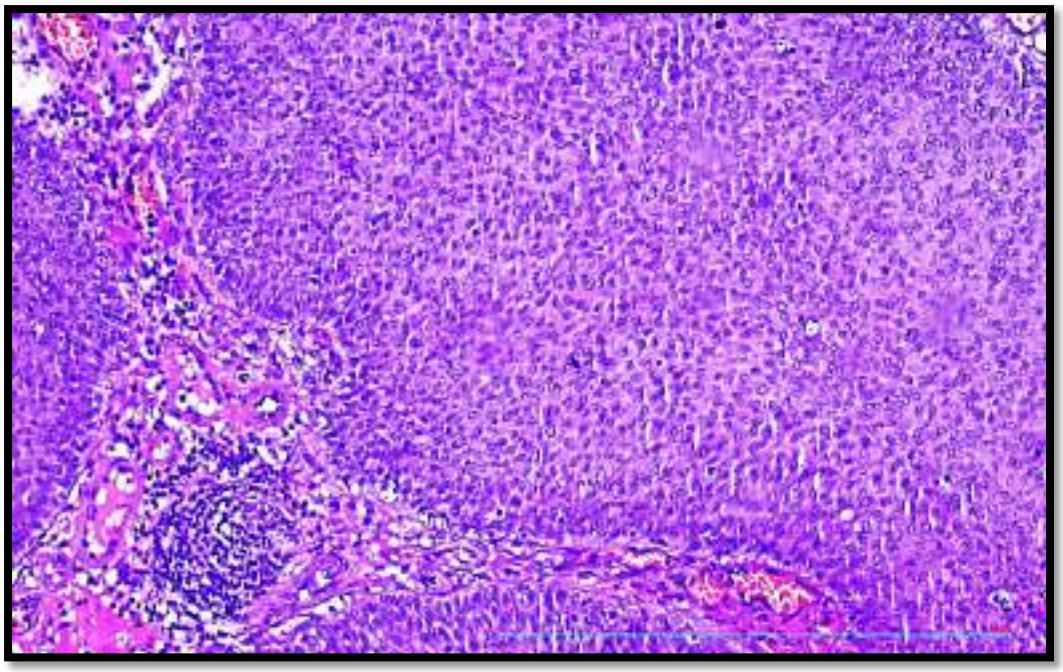
Picture 18– Photomicrograph of non-invasive papillary urothelial carcinoma, high grade showing >7 cell layer thick urothelium with loss of polarity (H&E, 400X)



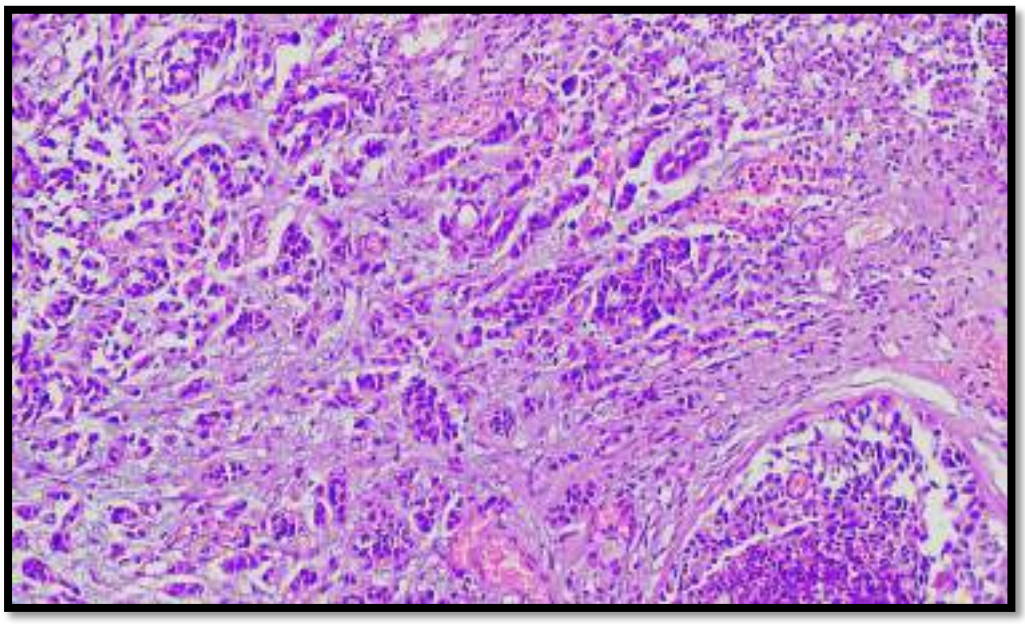
Picture 19– Photomicrograph of non-invasive papillary urothelial carcinoma, high grade showing moderate to marked nuclear pleomorphism (H&E,100X)



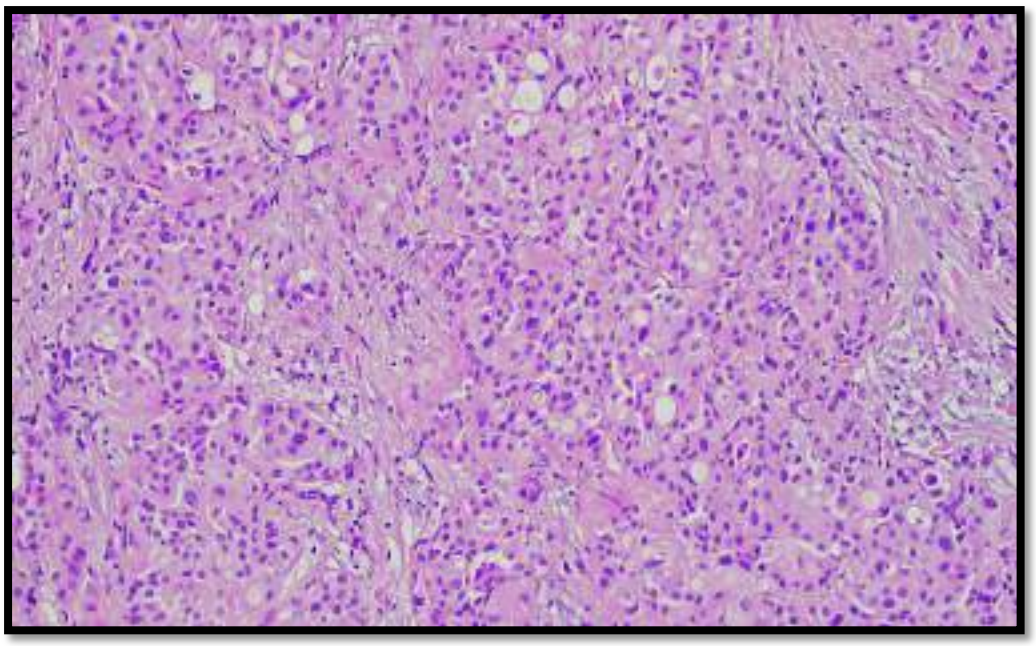
Picture 20–Photomicrograph of infiltrating urothelial carcinoma, high grade showing moderate to marked nuclear pleomorphism (H&E,100X)



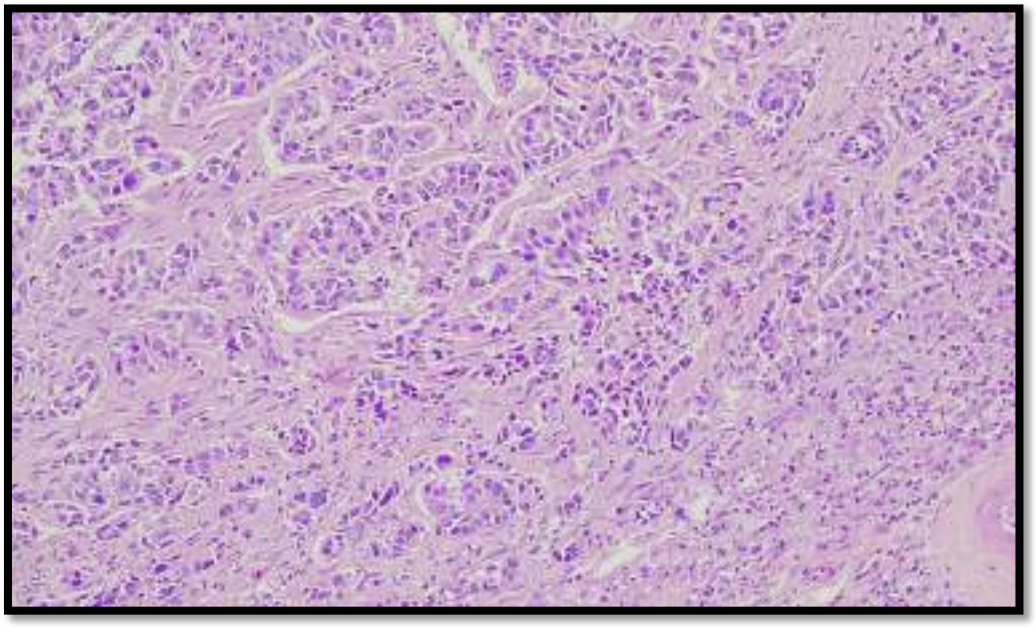
Picture 21 – Photomicrograph of papillary urothelial carcinoma, high grade showing frequent mitosis (H&E, 100X)



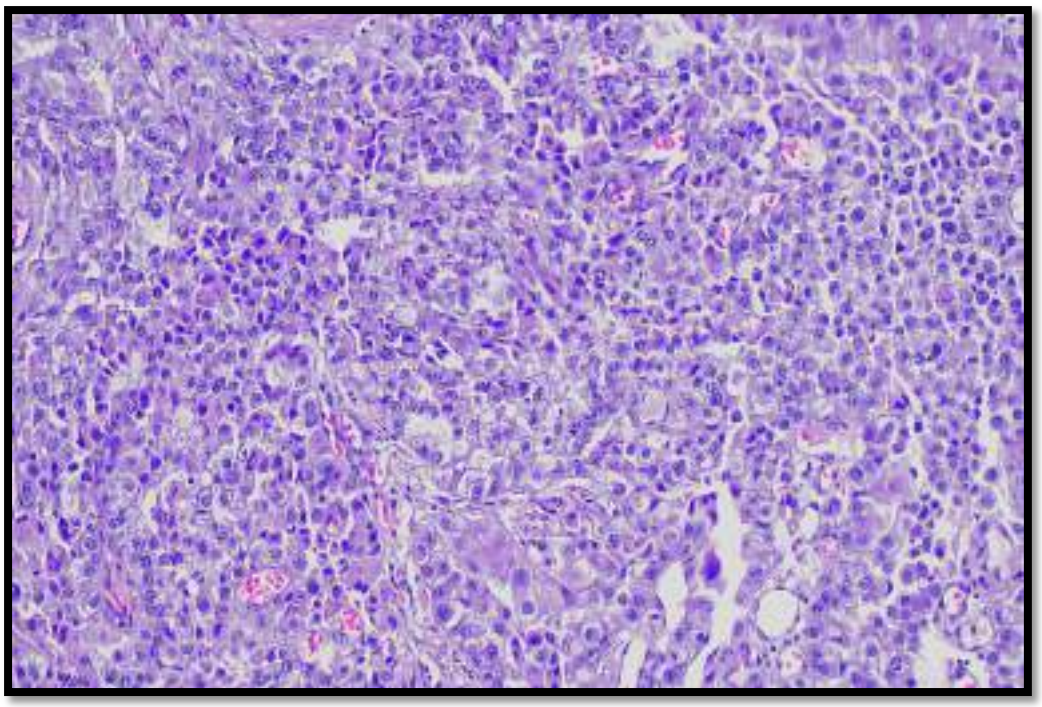
Picture 22– Photomicrograph of infiltrating urothelial carcinoma showing tumor cells arranged in nest and trabeculae (H&E, 100X)



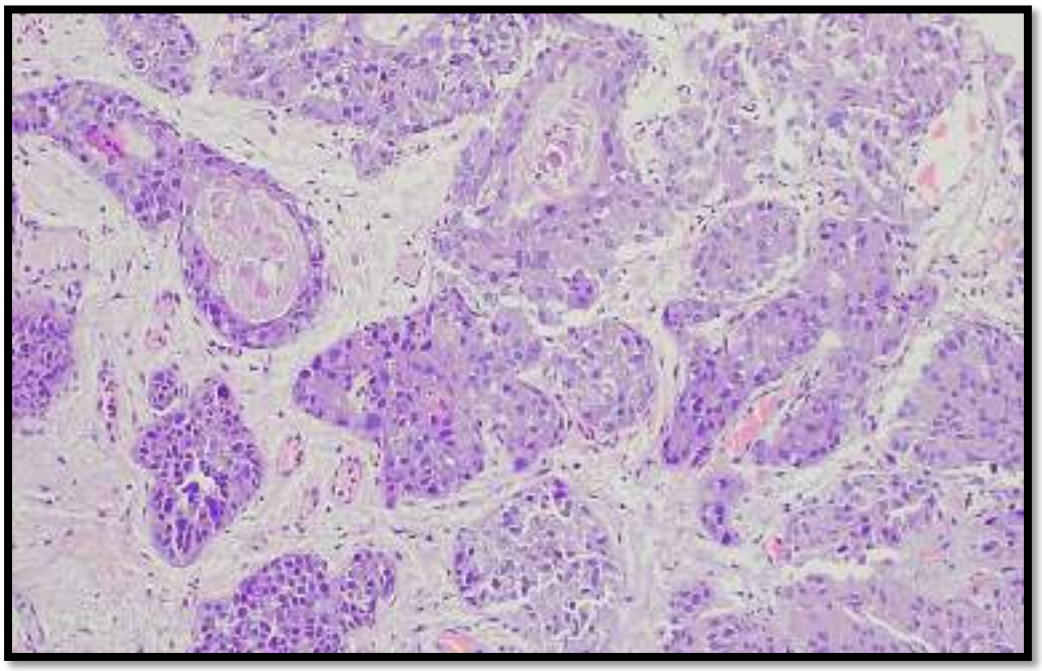
Picture 23-Photomicrograph of Infiltrating urothelial carcinoma showing tumor cells arranged in nests and singly dispersed cells exhibiting moderate to marked nuclear pleomorphism (H&E, 100X)



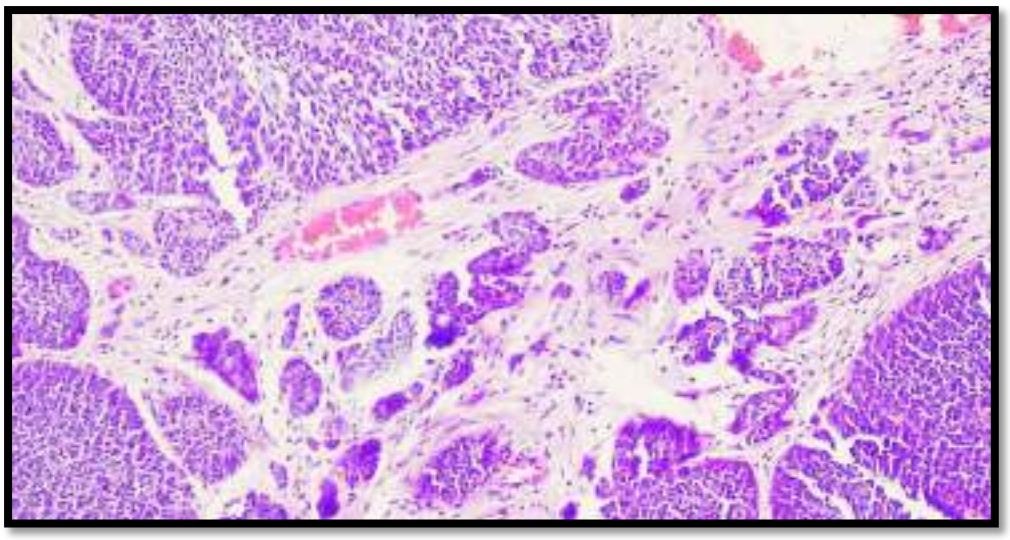
Picture 24- Photomicrograph of infiltrating urothelial carcinoma, high grade showing tumour cells arranged in nests(H&E,100X)



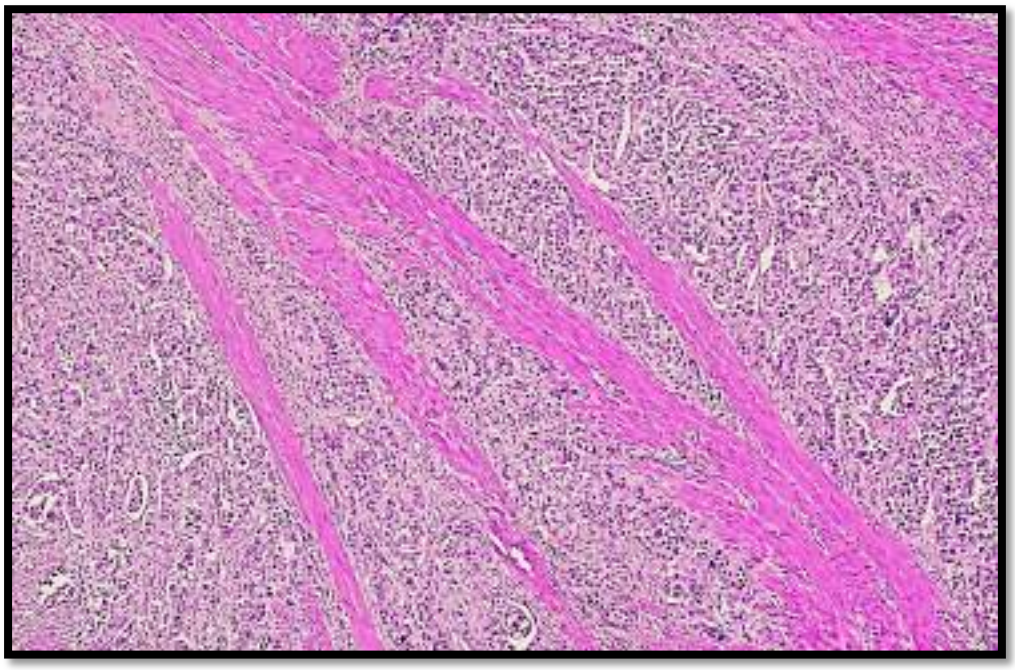
Picture 25 – Photomicrograph of infiltrating urothelial carcinoma, high grade showing tumor cells exhibiting moderate to marked nuclear pleomorphism (H&E,400X)



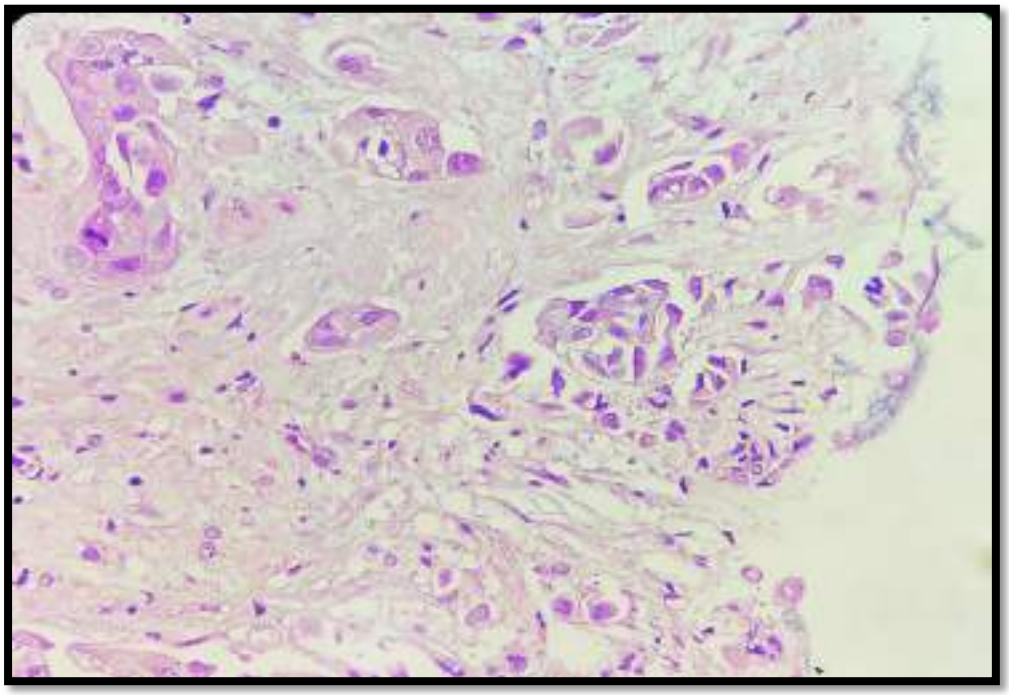
Picture 26–Photomicrograph of infiltrating urothelial carcinoma ,high grade showing invasion into the lamina propria(H&E,100X)



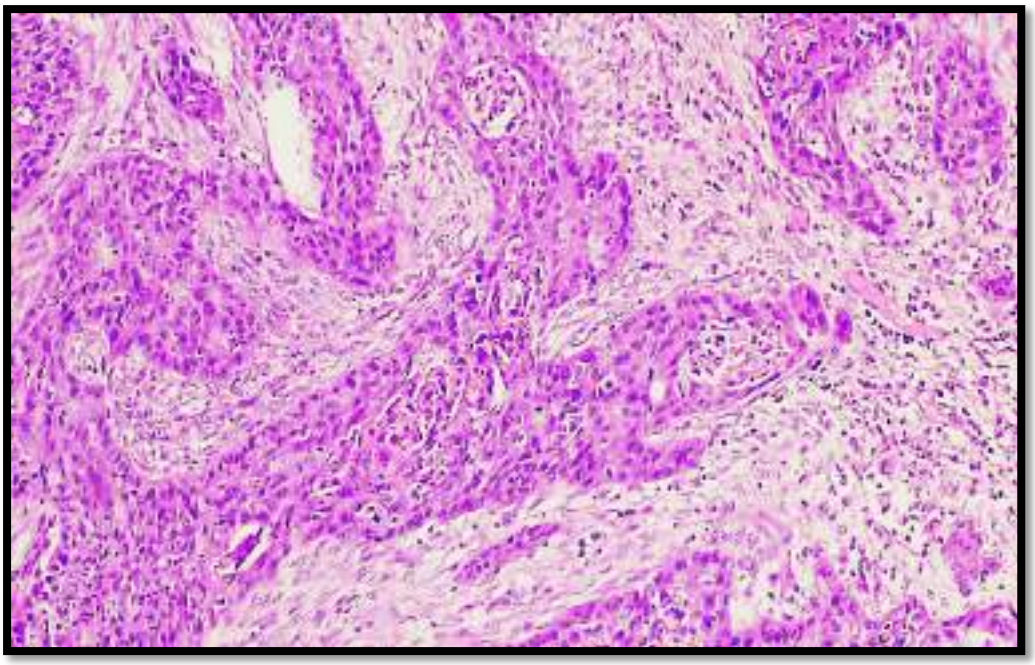
Picture 27– Photomicrograph of infiltrating urothelial carcinoma, low grade showing infiltration of lamina propria (H&E, 100X)



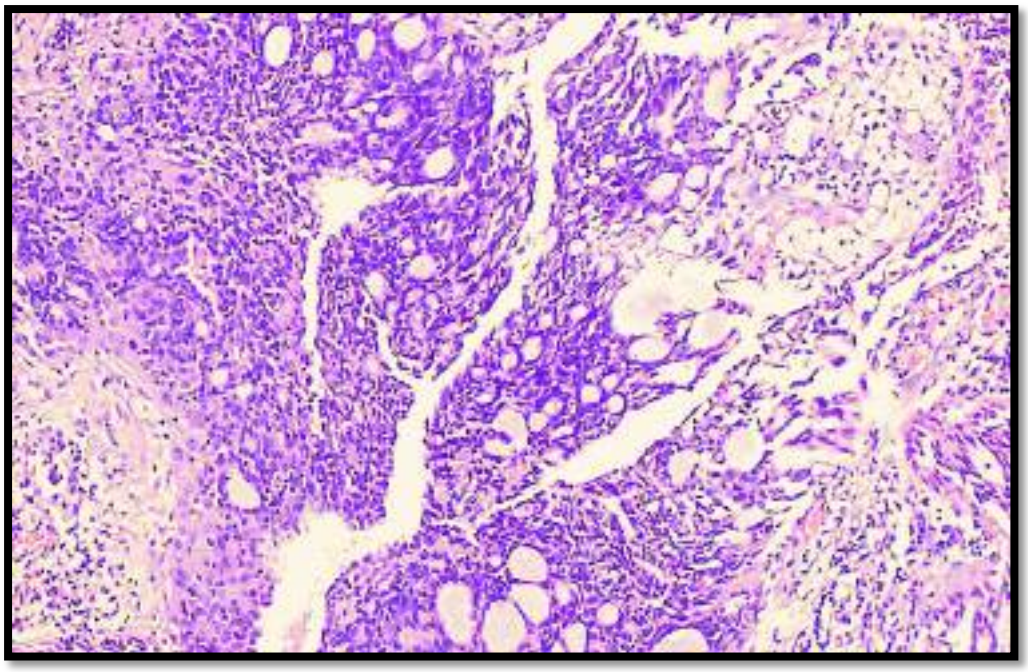
Picture 28-Photomicrograph of infiltrating urothelial carcinoma, high grade showing invasion of Detrusor muscle (H&E, 100X)



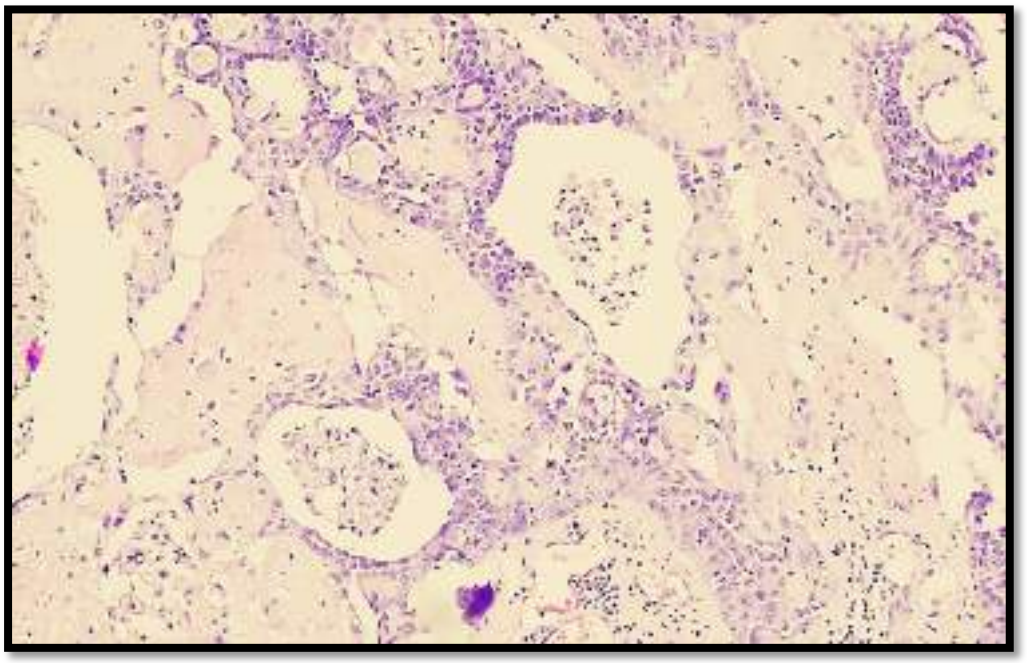
Picture 29-Photomicrograph of infiltrating urothelial carcinoma high grade with lymphovascular invasion (H&E,100X)



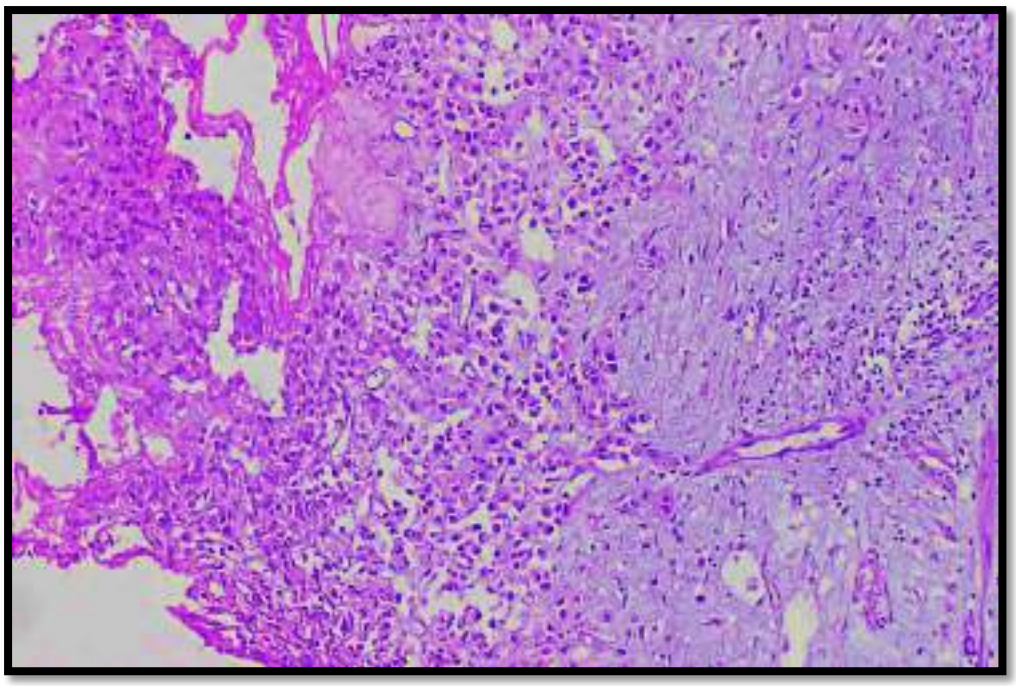
Picture 30–Photomicrograph of infiltrating urothelial carcinoma with squamous differentiation (H&E,100X)



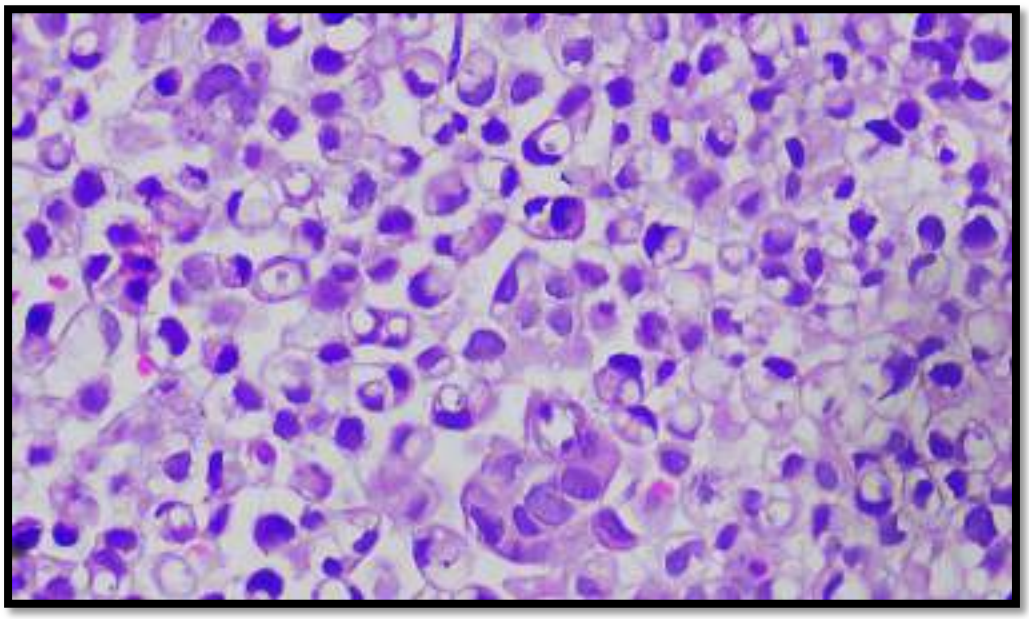
Picture 31– Photomicrograph of infiltrating urothelial carcinoma with glandular differentiation (H&E, 100X)



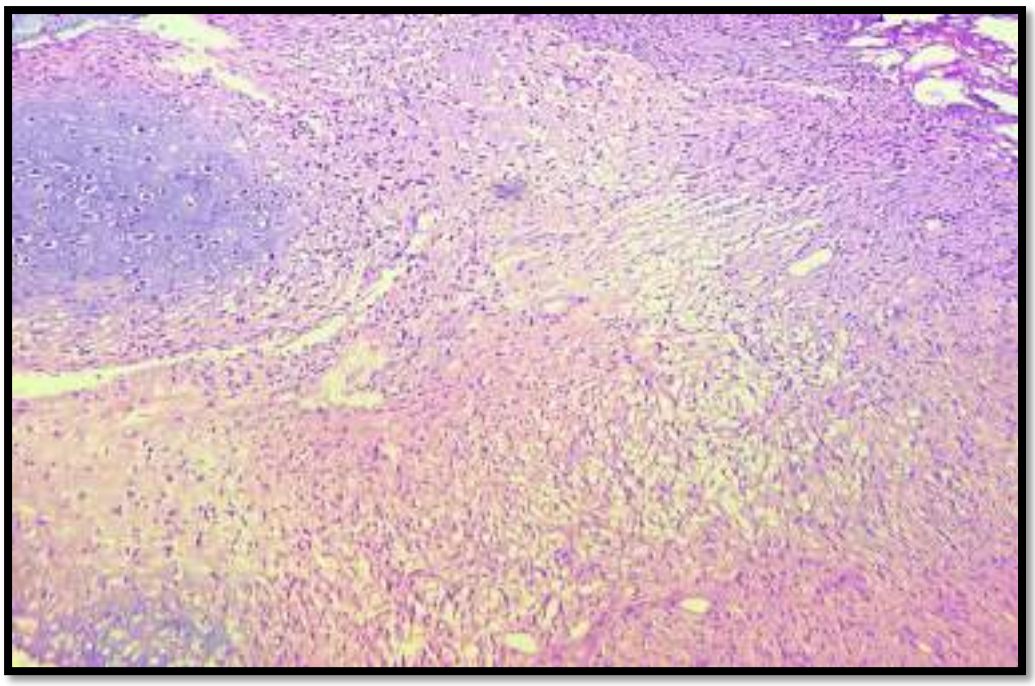
Picture 32– Photomicrograph of infiltrating urothelial carcinoma with glandular differentiation (H&E,100X)



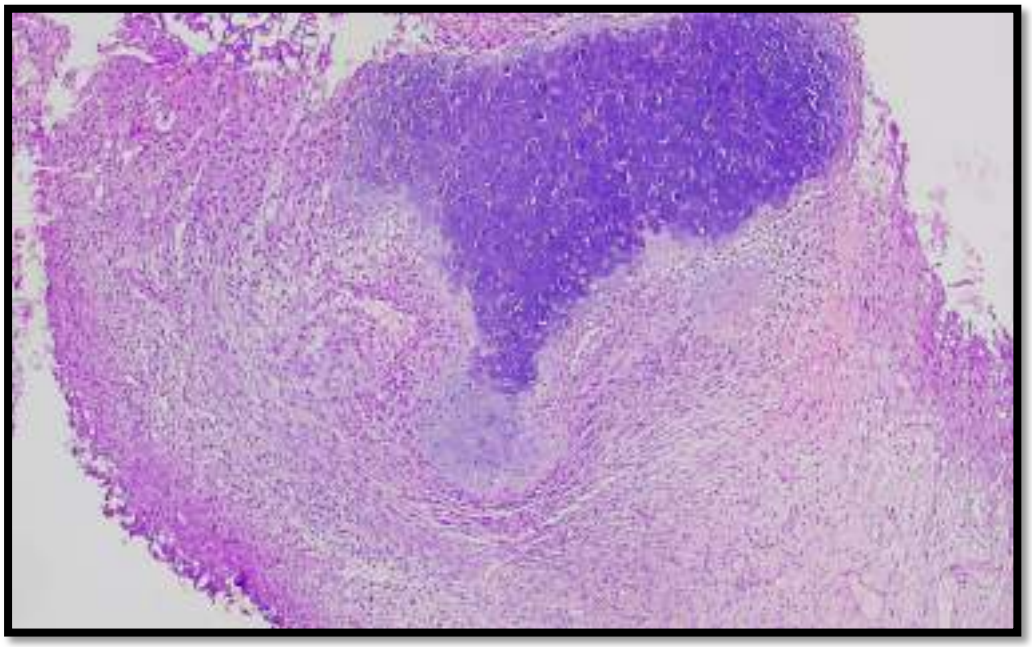
Picture 33- Photomicrograph of plasmacytoid variant of infiltrating urothelial carcinoma showing tumor cells arranged in nests (H&E, 100X)



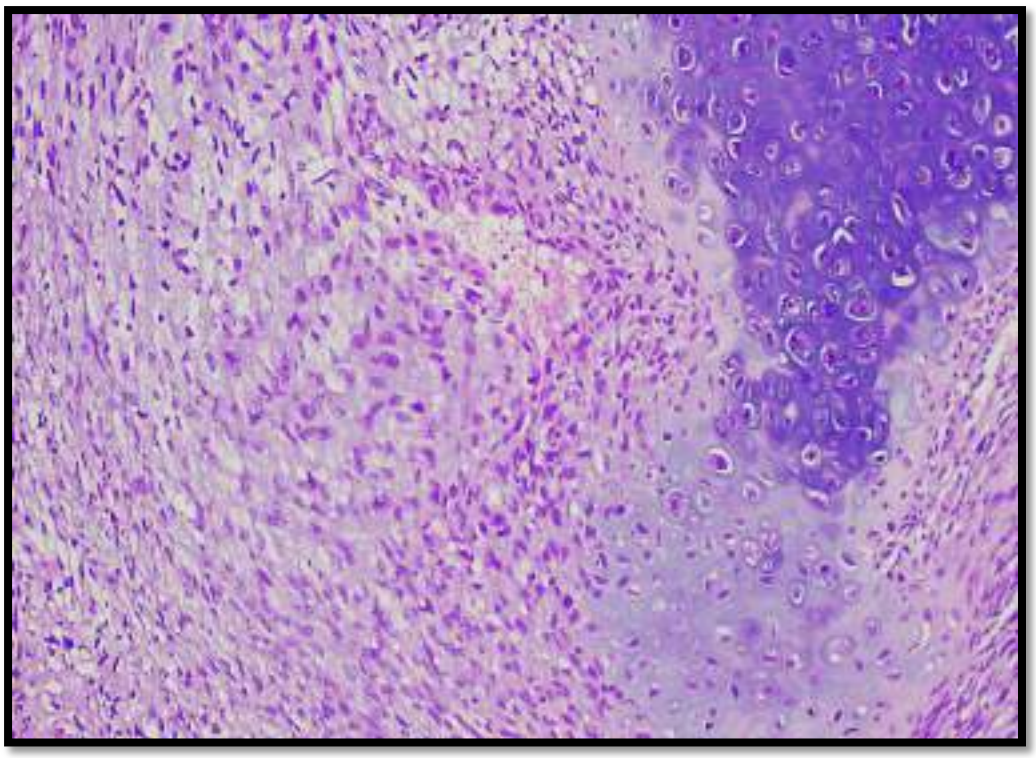
Picture 34- Photomicrograph of plasmacytoid variant of infiltrating urothelial carcinoma showing tumor cells having eccentric hyperchromatic nuclei and moderate amount of cytoplasm (H&E, 400X)



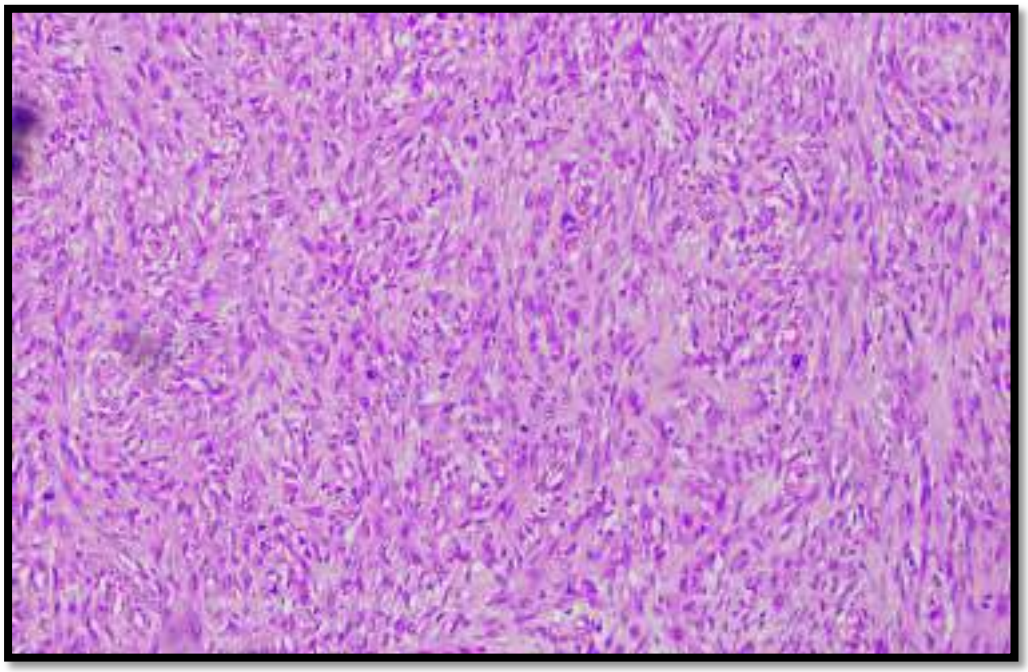
Picture 35- Photomicrograph of leiomyosarcoma with chondroid differentiation (H&E, 100X)



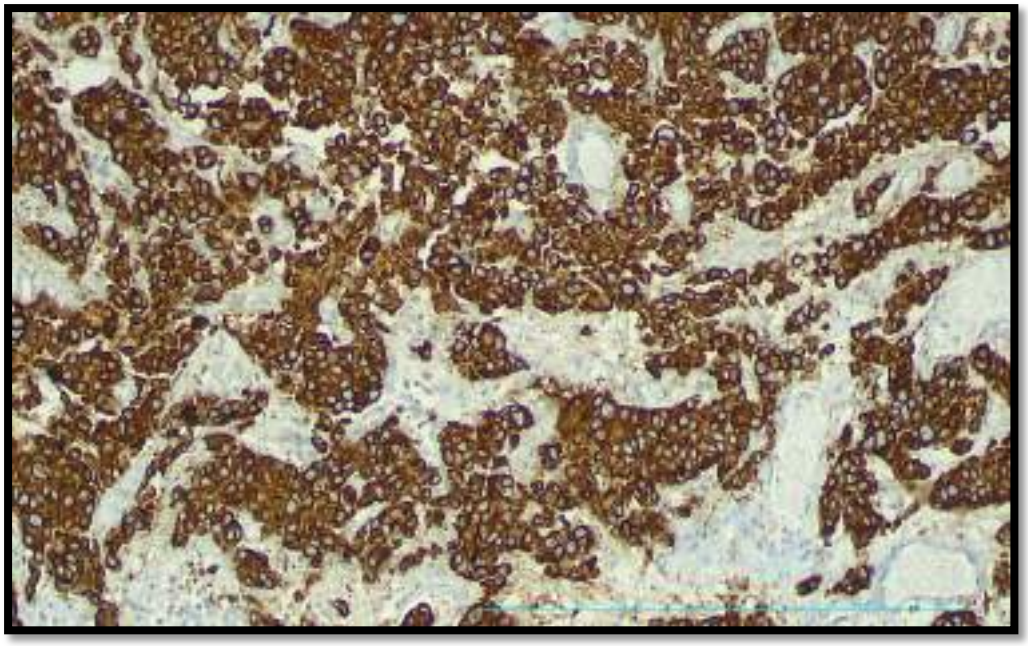
Picture 36- Photomicrograph of leiomyosarcoma with chondroid differentiation (H&E, 100X)



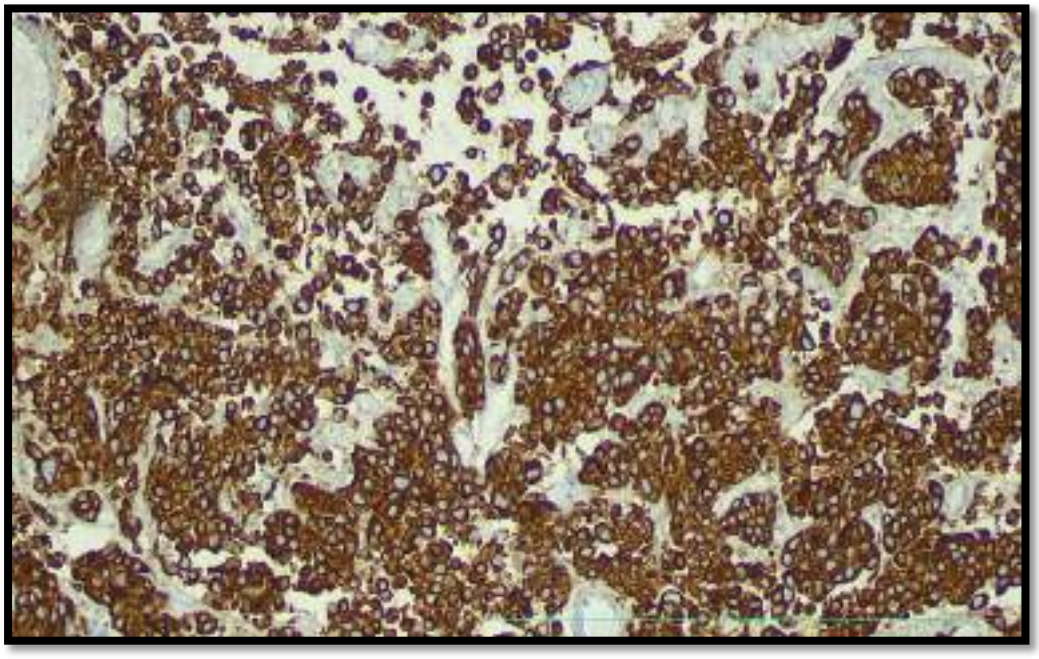
Picture 37- Photomicrograph of leiomyosarcoma with chondroid differentiation (H&E, 100X)



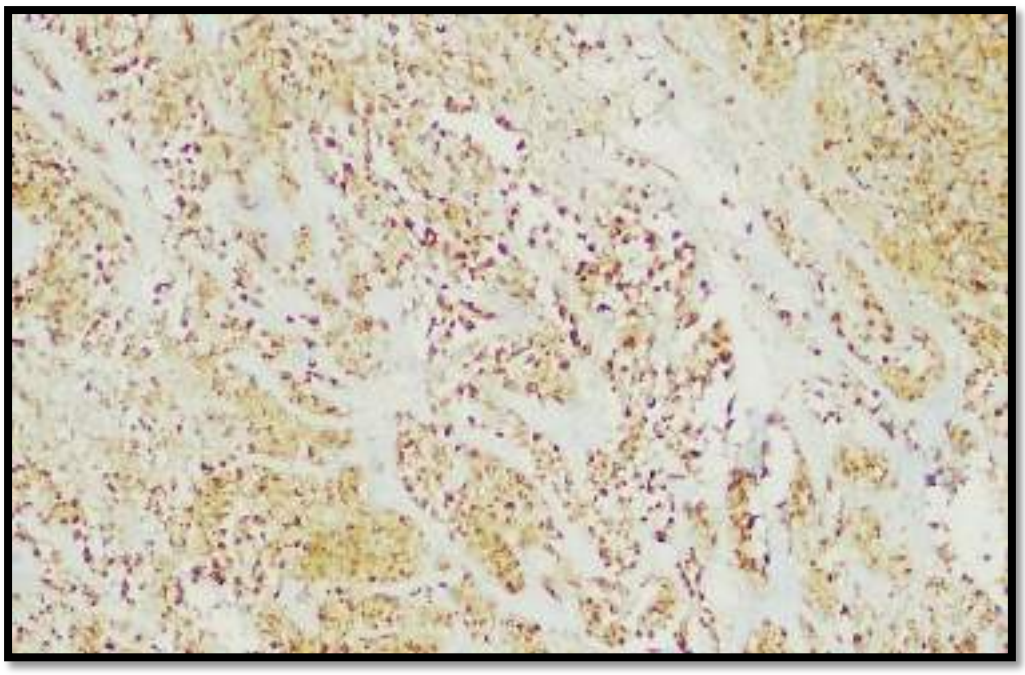
Picture 38- Photomicrograph of leiomyosarcoma showing spindle shaped cells having vesicular nuclei and moderate amount of cytoplasm (H&E, 400X)



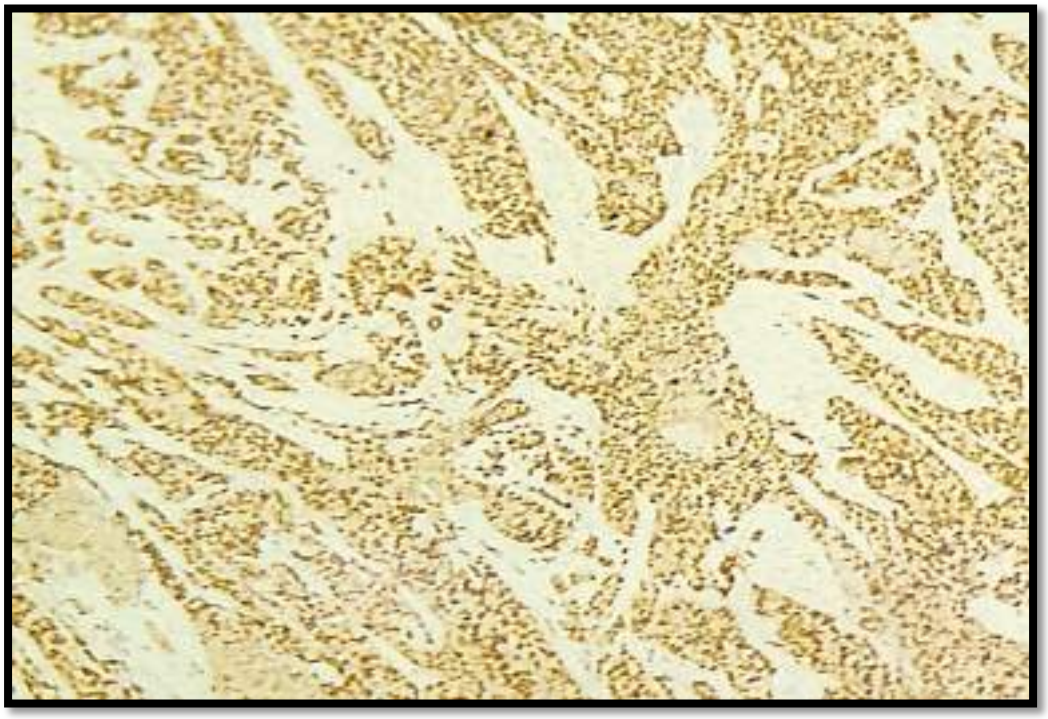
Picture 39 – Photomicrograph of infiltrating urothelial carcinoma showing membranous positivity of CK7 (H&E, 100X)



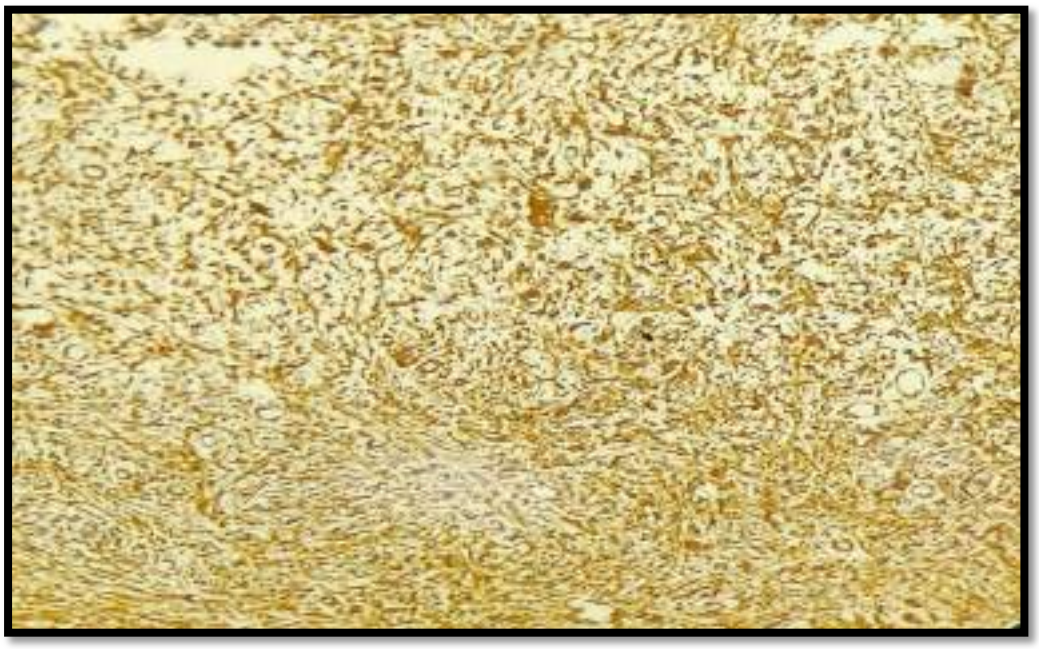
Picture 40– Photomicrograph of infiltrating urothelial carcinoma showing membranous positivity of CK 20 (H&E, 100X)



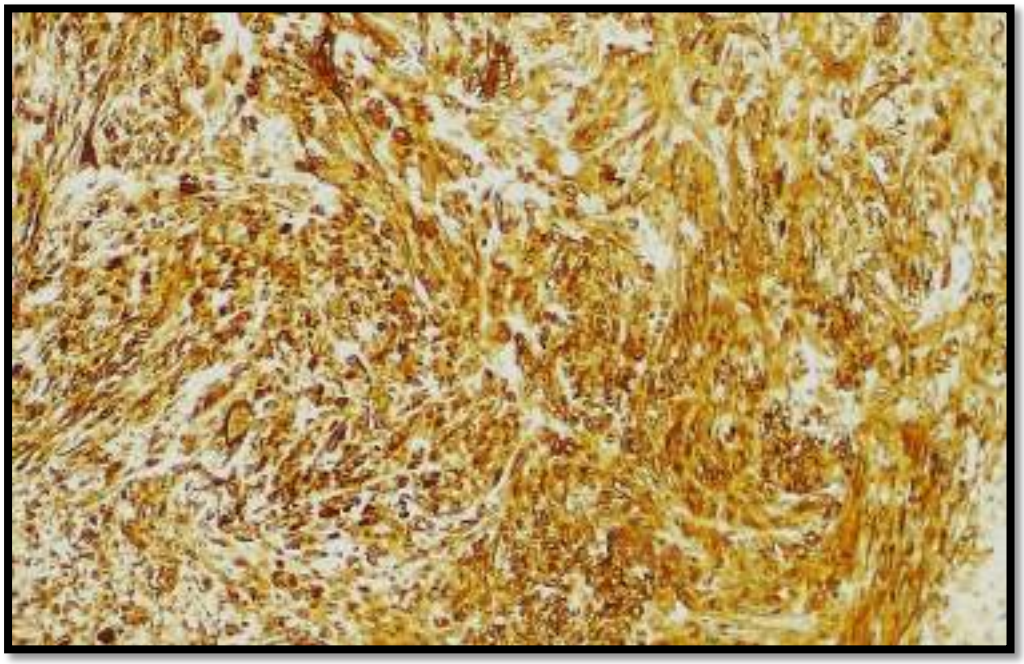
Picture 41– Photomicrograph of infiltrating urothelial carcinoma showing nuclear positivity of p63 in tumor cells (H&E, 100X)



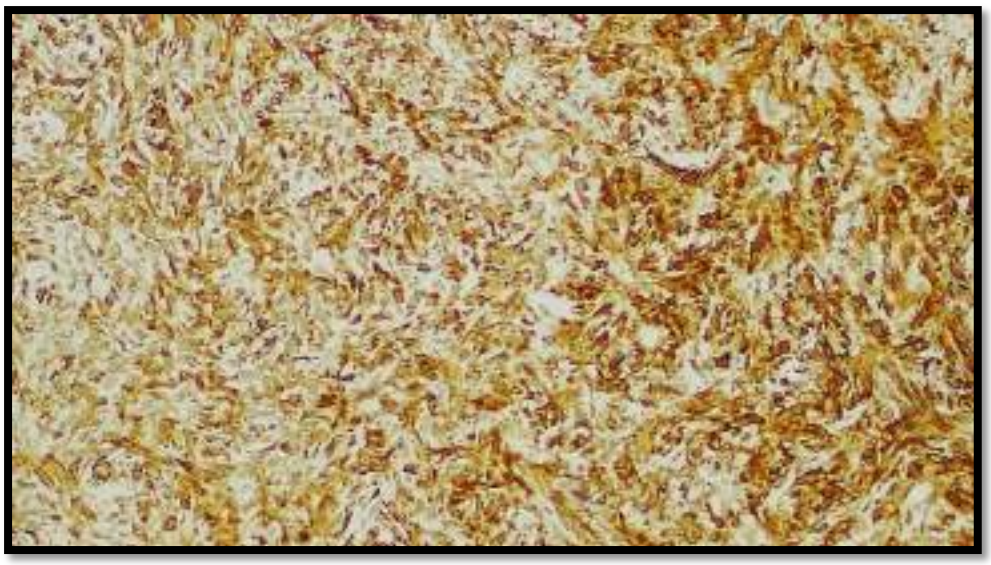
Picture 42– Photomicrograph of infiltrating urothelial carcinoma showing nuclear GATA-3 positivity in tumor cells (H&E, 100X)



Picture 43 – Photomicrograph of leiomyosarcoma showing cytoplasmic positivity of vimentin in spindle cell component (H&E, 400X)



Picture 44 – Photomicrograph of leiomyosarcoma showing cytoplasmic positivity of SMA in spindle cell component (H&E, 400X)



Picture 45– Photomicrograph of leiomyosarcoma showing cytoplasmic positivity of desmin (H&E, 100X)

Picture 46 – Photomicrograph of leiomyosarcoma showing 60% MIB-1 positivity in highest proliferating areas(H&E,100X)

KEY TO MASTER CHART

TURP	Transurethral resection of prostate
TURBT	Transurethral resection of bladder tumours
DM	Diabetes Mellitus
HTN	Hypertension
BPH	Benign prostatic hyperplasia
N. A	Not applicable
CT/ RT	Chemotherapy/ radiotherapy
HBV	Hepatitis B virus
HOPI	History of present illness
LVI	Lymphovascular invasion
PNI	Perineural invasion
LN	Lymph node

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
1	GC	61	M	1414526	13248	N.A	JALANDHAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	SMOKER	N.A	N.A	N.A	N.A	ABSENT	2CM GROWTH AT LEFT LATERAL WALL	LARGE BLADDER CLOTS	YES	0.6 CM
2	AN	42	M	321649	12021	N.A	BARNALA	PRESENT	ABSENT	ABSENT	ABSENT	UTI,BURNING MICTURITION,FEVER,PAIN IN SUPRAPUBIC REGION*5DAYS	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	TRIGONITIS PRESENT	NO ABNORMALITY DETECTED	YES	0.3 CM
3	SC	58	M	643751	13300, 13298	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1 WEEK	K/C/O TB, T2DM, HTN, CIRRHOSIS	SMOKER	N.A	N.A	N.A	N.A	ABSENT	1 CM GROWTH AT LEFT LATERAL WALL	RIGHT POSTEROLATERAL WALL GROWTH 2*0.8 CM	YES	1.1 CM
4	VD	65	M	1387558	11340	N.A	HAMIRPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	ALCOHOLIC, SMOKER	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	GROWTH 2CM IN RIGHT LATERAL WALL	IRREVERSIBLE HETEROGENOUSLY ENHANCING URINARY BLADDER WALL THICKENING	YES	2.5 CM
5	DS	74	M	1010774	11397	N.A	FEROZEPUR	ABSENT	PRESENT	ABSENT	ABSENT	HEMATURIA	H/O TURBT IN SEPT 2022	K/C/O HBV	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	MULTIPLE SMALL GROWTHS OF 1MM	CHRONIC CYSTITIS WITH FEW CALCIFIED LESIONS ALONG URINARY BLADDER WALL	YES	2.2 CM
6	SS	49	M	4779	11552	N.A	LUDHIANA	ABSENT	ABSENT	PRESENT	ABSENT	DIFFICULTY IN MICTURITION, DECREASED URINE OUTPUT* 3DAYS	POST TURBT	TYPE 2 DM	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH IN BLADDER NECK, RIGHT POSTEROLATERAL WALL AND DOME	IRREGULAR SOFT TISSUE THICKENING ALONG BLADDER BASE AND RIGHT POSTEROLATERAL WALL OF URINARY BLADDER	YES	3.5 CM
7	S	42	F	1391478	11603	N.A	AMBALA	PRESENT	ABSENT	ABSENT	ABSENT	PAIN EXTERNAL GENITALIA*10DAYS	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	BLADDER POLYP 1 CM IN LEFT LATERAL WALL	N.A	YES	0.8 CM
8	SS	71	M	1380398	11635, 11636, 11637	N.A	LUDHIANA	ABSENT	ABSENT	PRESENT	ABSENT	HEMATURIA,SHORTNESS OF BREATH,CHEST PAIN,FEVER	N.A	CHRONIC BIDI SMOKER*25YEARS,HYPOTHYROIDISM	N.A	N.A	N.A	N.A	ABSENT	2*2CM MASS OVER RIGHT POSTEROLATERAL WALL	N.A	NO	N.A
9	KD	61	F	771161	12547	N.A	PATHANKOT	PRESENT	ABSENT	ABSENT	ABSENT	FEVER,PUS IN URINE,DECREASED APPETITE,WEIGHT LOSS	T2DM, HTN, CKD	ON ATT SINCE 23-11-22	N.A	N.A	N.A	N.A	ABSENT	GROWTH 2*1CM AT LEFT ALTERAL WALL	POLYPOIDAL SOFT TISSUE LESION 3.6*2.4CM AT BLADDER BASE AND LEFT LATERAL WALL OF URINARY BLADDER	YES	0.5 CM
10	RK	65	F	1432808	14546	N.A	HOSHIARPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1MONTH	H/O TURBT IN 2020, 2022 AND H/O INTRAVESICAL BCG ADMINISTRATION	T2 DM, HTN, HYPOTHYROIDISM	N.A	N.A	N.A	N.A	ABSENT	2CM GROWTH AT ANTEROLATERAL WALL OF URINARY BLADDER	RESIDUAL LESION ALONG RIGHT ANTEROLATERAL WALL OF URINARY BLADDER	YES	1.2 CM
11	KD	59	F	1120773	14693	N.A	PATHANKOT	PRESENT	PRESENT	PRESENT	ABSENT	INABILITY TO PASS URINE,PAIN WHILE MICTURITION,HEMATURIA	N.A	K/C/O CARCINOMA VAGINA POST CT/RT	N.A	N.A	N.A	N.A	ABSENT	BLADDER CLOT OF 4*4CM,MULTIPLE PUNCTATE HAEOMORRHAGES IN URINARY BLADDER	INTRALUMINAL ECHOGENIC CONTENTS IN BLADDER LIKELY BLOOD CLOTS	YES	0.5 CM
12	KK	68	M	1093574	13622	1501	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	F/U/C/O TURP	HTN, CAD, HYPOTHYROIDISM	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH IN RIGHT LATERAL WALL	HETEROGENOUSLY ENHANCING SOFT TISSULE LESION IN DIVERTICULUM FROM RIGHT LATERAL WALL	NO	N.A
13	RL	63	M	1441199	211, 212	N.A	PHAGWARA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	K/C/O CLD WITH PORTAL HYPERTENSION	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY 2)	BLADDER GROWTH RIGHT LATERAL WALL INVOLVING RIGHT URETERIC ORIFICE	PLAQUE LIKE THICKENING INVOLB=VING BASE,POSTERIOR AND RIGHT LATERAL WALL OF BLADDER INVOLVING RIGHT VUJ	YES	1.5 CM
14	HS	68	M	1434704	186	N.A	HOSHIARPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	F/U/C OF CA BLADDER	HTN	N.A	N.A	N.A	N.A	ABSENT	RIGHT POSTEROLATERAL WALL GROWTH APPROX 5 MM	N.A	YES	0.6 CM
15	SS	64	M	1425564	402	N.A	RAJAURI,JAMMU	ABSENT	ABSENT	ABSENT	ABSENT	F/U/C/O CA BLADDER	H/O TURBT	T2 DM	N.A	N.A	N.A	N.A	SUSPICIOUS(CATEGORY-4)	PREVIOUS RESECTION SITE IDENTIFIED RIGHT ANTEROLATERAL WALL	POLYPOIDAL GROWTH 4*2CM RIGHT ANTEROLATERAL WALL OF URINARY BLADDER	YES	0.5CM
16	TC	84	M	334566	459	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*10DAYS	T2DM,ASTHMA	SMOKER	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH 5*3CM AT RIGHT ANTEROLATERAL WALL OF URINARY BLADDER	4.5*1.5CM GROWTH ALONG RIGHT POSTEROLATERAL WALL OF URINARY BLADDER	YES	2 CM
17	SS	70	M	1423628	655, 656	N.A	GURDASPUR	ABSENT	PRESENT	ABSENT	ABSENT	DECREASED URINE OUTPUT	C/O BPH	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROTH 1CM PRESENT AT RIGHT POSTEROLATERAL WALL NEAR TO LEFT VUJ	MASS LESION LEFT POSTEROLATERAL WALL URINARY BLADDER	YES	1.2 CM
18	TK	82	F	937753	820	N.A	MUKTSAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1WEEK	H/O CHOLECYSTECTOMY IN 2020, CAD	N.A	N.A	N.A	N.A	N.A	ABSENT	BROAD BASED GROWTH 3CM AT RIGHT POSTEROLATERAL WALL	SOLID LOBULATED GROWTH ADHERENT TO RIGHT POSTEROLATERAL WALL	YES	1.5 CM
19	NK	49	M	1450501	832, 833	N.A	LADHOWAL	PRESENT	ABSENT	PRESENT	ABSENT	PAIN WHILE MICTURATING*1MONTH, HEMATURIA*7DAYS	N.A	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	2.5CM GROWTH BROAD BASED POLYPOIDAL RIGHT LATERAL WALL	INTRAMURAL SOFT TISSUE LESION WITH CALCIFICATION RIGHTR POSTEROSUPERIOR WALL BLADDER	YES	1.1 CM
20	OP	65	M	1446184	825	N.A	UDHAMPUR,JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	LOWER BACKACHE,HEMATURIA*1WEEK	HTN, CVA, COPD	CHRONIC SMOKER	N.A	N.A	N.A	N.A	ABSENT	FLAT BLADDER GROWTH AT LEFT POSTEROLATERAL WALL	WALL THICKENING ALONG POSTEROLATERAL WALL SUGGESTIVE OF CYSTITIS	YES	0.4 CM
21	NJ	68	F	1450394	918	N.A	GHUMAR MANDI	ABSENT	ABSENT	ABSENT	PRESENT	URINARY LEAK*1MONTH	PREV 2 NVD	HTN	N.A	N.A	N.A	N.A	ABSENT	HAEMORRHAGIC SPOTS SEEN ALL OVER BLADDER, TRIGONITIS PRESENT	NO SIGNIFICANT ABNORMALITY	YES	0.4 CM
22	KD	76	F	1452530	1040	N.A	JAMMU	ABSENT	ABSENT	PRESENT	PRESENT	URINARY RETENTION ON AND OFF*1MONTH,INCONTINENCE,INCREASED FREQUENCY,DYSURIA	N.A	T2DM, UTI, HTN	N.A	N.A	N.A	N.A	ABSENT	CATHETER RELATED CHANGES AND TRABECULATIONS	BILATERAL PYELITIS	YES	0.3CM
23	RK	49	M	1454840	1077	N.A	SIRSA	ABSENT	PRESENT	PRESENT	ABSENT	POOR URINARY STREAM, BURNING MICTURITION	N.A	HTN	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	BLADDER DIVERTICULA PRESENT AT RIGHT POSTEROLATERAL WALL	LARGE DIVERTICULUM IN BLADDER FROM BASE	YES	1 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
1	GC	0.6*0.4*0.4cm	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
2	AN	0.3*0.2*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL, FOCAL REACTIVE CHANGES	LYMPHOCYTES	ABSENT	ABSENT	ABSENT	N.A	
3	SC	13300- 1*1*0.3CM, 13298-0.3*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
4	VD	2.5*2*1.5CM	NIL	NIL		NO	N.A	N,.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
5	DS	2.2*1.8*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
6	SS	3.5*2.8*1.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
7	S	0.8*0.6*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
8	SS	N.A	N.A	N.A	RADICAL	YES	POSTERIOR WALL	5.3*4.2*2CM	ULCEROPROLIFERATIVE	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	8		N.A	N.A	N.A	N.A	N.A	N.A	
9	KD	0.5*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL	NEUTOPHILS,LYMPHOCYTES	PRESENT	ABSENT	ABSENT	N.A	
10	RK	1.2*0.5*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
11	KD	0.5*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		FOCAL ULCERATION	LYMPHOCYTES	ABSENT	ABSENT	ABSENT	N.A	
12	KK	N.A	N.A	N.A	PARTIAL	YES	POSTERIOR WALL	4*3*2.5CM	SESSILE	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	7		N.A	N.A	N.A	N.A	N.A	N.A	
13	RL	211-0.5*0.4*0.2CM, 212-1.5*1*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
14	HS	0.6*0.5*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A			NEUTROPHILS,LYMPHOCYTES	ABSENT	ABSENT	ABSENT	N.A	
15	SS	0.5*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
16	TC	2*1.5*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
17	SS	655-0.5*0.4*0.2CM, 656-1.2*0.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
18	TK	1.5*0.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
19	NK	832-0.2*0.2*0.1CM, 833-1.1*1*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
20	OP	0.4*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
21	NJ	0.4CM LENGTH	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATYED	NEUTROPHILS,LYMPHOCYTES	ABSENT	ABSENT	ABSENT	N.A	
22	KD	0.3*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
23	RK	1*0.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
1	GC	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NIL	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
2	AN	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CYSTITIS GLANDULARIS
3	SC	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
4	VD	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
5	DS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE WITH FOCAL HIGH GRADE AREAS
6	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE
7	S	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
8	SS	ABSENT	ABSENT	>7	ABSENT	PRESENT	PRESENT	N.A	PRESENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	NOT INVOLVED	N.A	pT4a Nx Mnot applicable	HIGH GRADE MAILGNANT TUMOR-POSSIBLY INFILTRATING UROTHELIAL CARCINOMA
9	KD	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	GRANULOMATOUS CYSTITIS
10	RK	PRESENT	PRESENT	7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
11	KD	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
12	KK	ABSENT	ABSENT	N.A	ABSENT	N.A	N.A	N.A	PRESENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	NOT INVOLVED	DONE	pT1 N0 Mnot applicable	LEIOMYOSARCOMA WITH CHONDROID DIFFERENTIATION
13	RL	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	PRESENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
14	HS	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
15	SS	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	MUCOSAL ULCERATION	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
16	TC	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
17	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
18	TK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
19	NK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
20	OP	ABSENT	ABSENT	>7	ABSENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
21	NJ	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
22	KD	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CYSTITIS GLANDULARIS
23	RK	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
24	JS	5	M	1402033	1043	N.A	KAPURTHALA	ABSENT	ABSENT	ABSENT	ABSENT	N.A	K/C/O RHABDOMYOSARCOMA	N.A	N.A	N.A	N.A	N.A	ABSENT	NORMAL	PERSISTENT NODULAR THICKENING IN BLADDER DOME	YES	4.2 CM
25	KK	76	M	1456857	1158	N.A	JALANDHAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	YES	0.8 CM
26	KN	79	M	1457364	1253	N.A	GURDASPUR	PRESENT	ABSENT	PRESENT	ABSENT	PAINLESS GROSS HEMATURIA*1MONTH	HTN, HYPOTHYROIDISM	SMOKER	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	IRREGULAR GROWTH 3*1CM ALONG RIGHT LATERAL WALL AND BASE	ASYMMETRICAL WALL THICKENING INVOLVING POSTERIOR WALL OF URINARY BLADDER	YES	0.7 CM
27	KS	63	M	1456603	1252	N.A	JAMMU	PRESENT	ABSENT	PRESENT	ABSENT	PAINLESS GROSS HEMATURIA*5DAYS	DM, HTN	TOBACCO INTAKE	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	BLADDER GROWTH AT LEFT LATERAL WALL	LESION ALONG LEFT LATERAL WALL OF URINARY BLADDER	YES	2.0 CM
28	RV	63	M	1461893	1489	N.A	AMRITSAR	PRESENT	PRESENT	ABSENT	ABSENT	HEMATURIA, DECREASED URINE OUTPUT	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	BLADDER GROWTH 2*1 CM AT LEFT LATERAL WALL	LARGE HETEROGENOUS HYPOECHOIC AREA	YES	1 CM
29	BS	28	M	1461581	1507	N.A	SUNAM	ABSENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	PEDUNCULATED GROWTH 13MM ALONG RIGHT POSTEROLATERAL WALL	POLYPOIDAL MASS RIGHT POSTEROLATERAL WALL	YES	1 CM
30	MS	60	M	1464920	1765	N.A	MOGA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*3MONTHS, BURNING MICTURITION	DM, TUBERCULOSIS SINCE 1.5 YEAR	ALCOHOLIC	N.A	N.A	N.A	N.A	ABSENT	2.5 CM POLYPOIDAL GROWTH OVER RIGHT POSTEROLATERAL WALL	HYPERECHOIC MASS MEASURING 4*2.5CM OVER RIGHT ANTEROLATERAL WALL OF URINARY BLADDER	YES	2 CM
31	GK	71	F	1464894	1841	N.A	SAHNEWAL	PRESENT	ABSENT	PRESENT	ABSENT	PAINLESS GROSS HEMATURIA*20 DAYS, BURNING MICTURITION	HTN, DM, AYURVEDIC TREATMENT FOR HEMATURIA*2015	N.A	N.A	N.A	N.A	N.A	ABSENT	PEDUNCULATED GROWTH 3*3CM ALONG LEFT LATERAL WALL	5.4*5.2*5CM GROWTH ALONG LEFT INFEROLATERAL WALL	YES	2 CM
32	B	70	F	893606	2075	N.A	UDHAMPUR,JAMMU	ABSENT	ABSENT	ABSENT	ABSENT	F/U/C/O CA BLADDER	H/O TURBT IN 2020	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH PRESENT AT RIGHT POSTEROLATERAL WALL 0.5CM IN SIZE	N.A	YES	0.2 CM
33	TC	61	M	1470445	2138, 2139	N.A	RAJAURI,JAMMU	PRESENT	ABSENT	PRESENT	ABSENT	HEMATURIA, PAINFUL MICTURITION	DM, HTN, H/O TURBT, 1 GEMCITABINE INJECTION(INTRAVESICAL)	N.A	N.A	N.A	N.A	N.A	ABSENT	2.5CM GROWTH OVER RIGHT LATERAL WALL OF URINARY BLADDER	ECHOGENIC CONTENT MEASURING 5.1*4.5*3.5CM	YES	1.5 CM
34	TS	62	M	1475366	2469	N.A	JAGRAON, LUDHIANA	PRESENT	ABSENT	PRESENT	ABSENT	HEMATURIA, DYSURIA, PYURIA*5DAYS	DM, H/O TURBT	OPIUM INTAKE	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	2CM GROWTH PRESENT IN ANTERIOR INFERIOR NECK OF DIVERTICULUM	ASYMMETRICAL WALL THICKENING OF URINARY BLADDER WITH MULTIPLE DIVERTICULAE	YES	1 CM
35	GS	48	M	84095	2480	N.A	MUKERIAN, HOSHIARPUR	ABSENT	ABSENT	ABSENT	ABSENT	K/C/O CARCINOMA URINARY BLADDER	H/O TURBT IN 2021, 2022 FOLLOWED BY INTRAVESICAL MITOMYCIN-C	SMOKER	N.A	N.A	N.A	N.A	ABSENT	POLYPOIDAL GROWTH OF 1.5*1CM ON LEFT POSTEROLATERAL WALL	POLYPOIDAL LESION MEASURING 11.2*10.3MM IN RIGHT LATERAL WALL	YES	0.4 CM
36	SS	63	M	145689	2558	N.A	KANGRA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A		N.A	N.A	N.A	ABSENT	GROWTH 3*1CM ON LEFT LATERAL WALL	N.A	YES	0.8CM
37	RS	66	M	463334	2739	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	1.5CM GROWTH PRESENT AT LEFT POSTEROLATERAL WALL	HETEROGENOUSLY HYPERECHOIC AREA MEASURING 7MM ALONG LEFT POSTEROLATERAL WALL	YES	1.2 CM
38	SS	54	F	1485559	3190	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*2DAYS	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH 2.5CM OVER LEFT POSTEROLATERAL WALL	POLYPOIDAL MASS MEASURING 3*2CM ALONG LEFT POSTEROLATERAL WALL	YES	3.8 CM
39	PK	33	F	1484759	3137	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	PAIN LOWER ABDOMEN*3DAYS, HEMATURIA*1YEAR	K/C/O UTERINE FIBROIDS	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	5*5MM GROWTH OVER RIGHT POSTEROLATERAL WALL OF URINARY BLADDER	5*3MM GROWTH FROM POSTERIOR WALL	YES	0.3 CM
40	MR	76	M	1217256	3193	N.A	JAMMU	ABSENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY OF MICTURITION	HTN, COPD, POST TURBT IN 2021	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	0.8 CM
41	VK	45	M	1489618	3506, 3507	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*15DAYS	N.A	SMOKER, ALCOHOLIC	N.A	N.A	N.A	N.A	ATYPICAL CELLS (CATEGORY-3)	POLYPOIDAL GROWTH 3CM OVER RIGHT POSTEROLATERAL WALL	SOFT TISSUE LESION ALONG LATERAL WALL OF URINARY BLADDER INVOLVING RIGHT VUJ	YES	2 CM
42	AK	64	M	1482956	3444, 3445, 3446	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1 MONTH	23-3133-INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE	N.A	N.A	N.A	N.A	N.A	ABSENT	6*4CM GROWTH ON LEFT POSTEROLATERAL WALL OF URINARY BLADDER	ASYMMETRICAL WALL THICKENING ALONG LEFT LATERAL WALL AND BASE	NO	13 CM
43	SK	75	M	1490191	3527	N.A	GURDASPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*2DAYS	DM, HTN, ASTHMA	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	LEFT URETERIC ORIFICE OCCLUDED WITH BLOOD CLOT ?GROWTH	3.6*1.5CM HETEROECHOIC CONTENTS ALONG LEFT LATERAL WALL OF URINARY BLADDER	YES	4 CM
44	SC	59	M	643751	3538, 3539	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	POST TURBT,DM, PULMONARY KOCH'S *2018, CLD	SMOKER	N.A	N.A	N.A	N.A	ABSENT	5*5MM GROWTH OVER LEFT LATERAL WALL OF URINARY BLADDER	ASYMMETRICAL URINARY BLADDER WALL THICKENING	YES	0.4 CM
45	AG	46	F	54925	3887	N.A	SANGRUR	PRESENT	ABSENT	ABSENT	PRESENT	HEMATURIA, INCREASED FREQUENCY	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	2*1CM GROWTH AT LEFT LATERAL WALL	N.A	YES	4 CM
46	BS	68	M	1493065	3881	N.A	FEROZEPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1MONTH	N.A	ALCOHOLIC*12YEARS(NOW STOPPED)	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	3 GROWTHS APPROX. 2 CM IN BLADDER BASE, 2.5CM IN LEFT POSTEROLATERAL WALL AND 1CM IN LEFT LATERAL WALL	BLADDER TUMOR ARISING FROM LEFT VUJ, 3 IN NUMBER	YES	1.8 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
24	JS	4.2*3.5*0.8 CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL	LYMPHOCYTES	ABSENT	PRESENT	PRESENT	N.A	
25	KK	0.8*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
26	KN	0.7*0.5*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
27	KS	2*1.5*1.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
28	RV	1*0.8*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
29	BS	1*0.8*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
30	MS	2*1.5*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
31	GK	2*1.2*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
32	B	0.2*0.2*0.1CM	NIL	NIL		NIL	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
33	TC	2138-1.5*0.8*0.6CM, 2139-1.2*0.8*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
34	TS	1*0.5*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
35	GS	0.4*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
36	SS	0.8*0.6*0.6CM							N.A								N.A	N.A	N.A	N.A	N.A	N.A	
37	RS	1.2*0.8*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
38	SS	3.8*2*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
39	PK	0.3*0.2*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
40	MR	1-0.8*0.4*0.3CM, 2-0.4*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
41	VK	3506-1.2*0.6*0.2CM, 3507-2*1.2*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
42	AK	3444-1.5*0.6*0.2CM, 3445-3.5*2.8*1CM, 3446-13*6.5*4.5CM	NIL	NIL	RADICAL	YES	POSTERIOR WALL	3.6*2.2*1CM	PAPILLARY	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	3		N.A	N.A	N.A	N.A	N.A	N.A	
43	SK	1- 4*0.5*0.2CM, 2-0.5*0.4*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
44	SC	3538-0.4*0.3*0.2CM, 3539-0.4*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N	N	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
45	AG	4*2*2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
46	BS	1.8*0.8*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
24	JS	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
25	KK	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
26	KN	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INAVSIVE PAPILLARY UROTHELIAL CARCINOMA. LOW GRADE
27	KS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE
28	RV	PRESENT	PRESENT	>7	PRESENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	PAPILLARY UROTHELIAL NEOPLASM OF LOW MALIGNANT POTENTIAL
29	BS	PRESENT	PRESENT	>7	PRESENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	PAPILLARY UROTHELIAL NEOPLASM OF LOW MALIGNANT POTENTIAL
30	MS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
31	GK	PRESENT	PRESENT	5	PRESENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	PAPILLARY UROTHELIAL NEOPLASM OF LOW MALIGNANT POTENTIAL
32	B	PRESENT	PRESENT	>7	PRESENT	ABSENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	PAPILLARY UROTHELIAL NEOPLASM OF LOW MALIGNANT POTENTIAL
33	TC	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
34	TS	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
35	GS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
36	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
37	RS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
38	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
39	PK	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
40	MR	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
41	VK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
42	AK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	INVOLVED(2/3)	DONE	PT4 N2 Mnot applicable	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
43	SK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
44	SC	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
45	AG	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
46	BS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
47	VR	71	F	1496020	3940	N.A	PHILLAUR, JALANDHAR	PRESENT	ABSENT	ABSENT	PRESENT	HEMATURIA, FREQUENCY AND URGENCY*2DAYS	HTN	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	2.5CM GROWTH AT POSTERIOR WALL	BLADDER GROWTH 24MM IN POSTEROLATERAL WALL OF URINARY BLADDER	YES	1.8 CM
48	GP	65	M	1497663	4072	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*2DAYS	HTN, DM	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH APPROX. 1.5CM OVER LEFT POSTEROLATERAL WALL	ILL DEFINED POLYPOIDAL LESION MEASURING 1.7*1CM ALONG LEFT POSTEROLATERAL WALL OF URINARY BLADDER	YES	1 CM
49	BS	70	M	278372	4142	N.A	MOGA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1WEEK	DM, POST TURBT IN 2017	N.A	N.A	N.A	N.A	N.A	ABSENT	BLADDER GROWTH APPROX. 3*2CM AT LEFT LATERAL WALL OF URINARY BLADDER	18*14MM POLYPOIDAL LESION ALONG LEFT POSTEROLATERAL WALL OF BLADDER LIKELY MALIGNANT	YES	1.5 CM
50	PS	58	M	1309284	4144	N.A	MOGA	ABSENT	ABSENT	ABSENT	ABSENT	K/C/O CARCINOMA URINARY BLADDER*1 YEAR	HTN	ALCOHOLIC	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	BLADDER GROWTH PRESENT AT PREVIOUS RESECTION SITE AND LEFT LATERAL WALL	POLYPOIDAL GROWTH 11*9MM ALONG LEFT LATERAL WALL	YES	0.8 CM
51	MG	72	F	1360178	4193	N.A	KANGRA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*1DAY	DM, HTN, HYPOTHYROIDISM	N.A	N.A	N.A	N.A	N.A	ABSENT	2 BLADDER GROWTHS MEASURING 9MM ALONG RIGHT LATERAL WALL AND 4MM IN DOME	ECHOGENIC CONTENT MEASURING 8.5*8MM ALONG RIGHT LATERAL WALL	YES	0.8 CM
52	SK	57	M	1463130	4514, 4516	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*2 MONTHS	HTN, DM	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	0.8 CM
53	SS	23	M	1565197	4664	N.A	FAZILKA	ABSENT	ABSENT	ABSENT	ABSENT	PAIN LEFT LUMBAR REGION*2YEARS	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX. 10MM PRESENT AT LEFT LATERAL WALL	POLYPOIDAL WALL THICKENING 6*5MM ALONG LEFT LATERAL WALL	YES	0.8 CM
54	RS	92	M	1426411	4929	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	2*1CM GROWTH AT LEFT LATERAL WALL	N.A	YES	1 CM
55	RK	60	M	1509655	4931	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	3*1CM GROWTH RIGH LATERAL WALL AND ANTERIOR WALL	N.A	YES	1.5 CM
56	PS	43	M	1511147	5160	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*10DAYS	HYPOTHYROIDISM, VALVULAR HEART DISEASE	ALCOHOLIC	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	RIGHT LATERAL WALL UB GROWTH MEASURING APPROX. 1CM	NODULAR SOFT TISSUE LESION INVOLVING RIGHT PL WALL MEASURING 11*7MM	YES	1 CM
57	RS	68	M	1512814	5280	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	PASSAGE OF SMALL CLOT IN URINE*1 WEEK BACK	DM, HTN	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	RL WALL POLYPOIDAL GROWTH APPROX 1CM	1.6*1.1CM ECHOGENIC CONTENT ALONG RL WALL OF URINARY BLADDER	YES	0.6 CM
58	G	70	M	1296978	5345	N.A	KAPURTHALA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*4DAYS, PAIN LOWER ABDOMEN	POST TURBT, HTN, ASTHMA	SMOKER, ALCOHOLIC	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX. 1CM AT LL BLADDER NECK	INTERNAL ECHOES IN UB LUMEN	YES	0.5 CM
59	RK	55	M	1514491	5368	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	2*2 CM GROWTH AT ANTERIOR AND POSTERIOR WALL	N.A	YES	1.2 CM
60	BR	68	M	1515151	5572	N.A	PATHANKOT	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA, DIFFICULTY IN BREATHING, ABDOMINAL DISTENSION, PEDAL EDEMA*2MONTHS	DM, HTN	ALCOHOLIC	N.A	N.A	N.A	N.A	SUSPICIOUS FOR HGUC(CATYEGORY-4)	POLYPOIDAL GROWTH OVER LL WALL OF UB	HETEROGENOUS HYPOECHOIC LESION MEASURING 5.5*3.6CM IN RELATION TO BLADDER BASE AND LL WALL	YES	1 CM
61	HS	65	M	1514878	5607	N.A	SANGRUR	PRESENT	ABSENT	ABSENT	ABSENT	PAINLESS HEMATURIA*10-15DAYS	DM	N.A	N.A	N.A	N.A	N.A	ABSENT	POLYPOIDAL GROWTH APPROX. 1CM IN BLADDER BASE	ILL DEFINED LESION ALONG BLADDER BASE MEASURING 27*22MM	YES	1 CM
62	SS	45	M	1517821	5597	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA*2WEEKS	N.A	ALCOHOLIC	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	2*1.3CM GROWTH ARISING FROM LL WALL OF URINARY BLADDER	YES	1 CM
63	NK	72	M	1520144	5829	N.A	JALANDHAR	PRESENT	ABSENT	ABSENT	PRESENT	HEMATURIA*3DAYS, INCREASED FREQUENCY OF MICTURITION, INCOMPLETE VOIDING	N.A	N.A	N.A	N.A	N.A	N.A	SUSPICIOUS FOR HGUC(CATEGORY-4)	5*5CM GROWTH PRESENT OVER ANTERIOR AND LATERAL WALL OF UB	POLYPOIDAL MASS 41*33*25MM MASS ALONG ANTERIOR AND LEFT LATERAL WALL OF UB	YES	1.2 CM
64	AK	56	M	1309067	6428	N.A	LUDHIANA	ABSENT	ABSENT	PRESENT	PRESENT	PAINFUL MICTURITION, INCREASED FRQUENCY	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH 2*1CM AT LEFT LATERAL WALL	WELL DEFINED MASS LESION MEASURING 15*2.4MM OCCLUDING RIGHT VUJ	YES	2.8 CM
65	NS	65	M	1529414	6501	N.A	MOGA	PRESENT	ABSENT	ABSENT	ABSENT	PAINLESS HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	2*1CM POLYPOIDAL GROWTH AT DOME AND RIGHT LATERAL WALL	N.A	YES	1 CM
66	SR	71	M	1494909	6767	N.A	JALANDHAR	ABSENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY OF MICTURITION	23-3882-ACINAR ADENOCARCINOMA-PROSTATE	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY 3)	MULTIPLE GROWTHS PRESENT AT LEFT LATERAL WALL LARGEST 2 CM	3*2.8CM MASS LESION ALONG PL WALL OF URINARY BLADDER- MALIGNANT	YES	2 CM
67	LR	73	M	1534881	7027	N.A	MUKTSAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	GROWTH 3*2CM AT RIGHT LATERAL AND ANTERIOR WALL	HETEROGENOUS ENHANCING POLYPOIDAL MASS INVOLVING RIGHT PW MEASURING 3.4*2.6*2CM	YES	4.5 CM
68	AS	62	M	1533160	7132	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	PAINLESS HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH 2*1CM AT DOME OF BLADDER	MULTIPLE POLYPOIDAL LESIONS SEEN IN RELATION TO SUPERIOR AND LATERAL WALL OF UB	YES	1.8 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
47	VR	1.8*1.5*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
48	GP	1*1*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
49	BS	1.5*1*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
50	PS	0.8*0.5*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
51	MG	0.8*0.6*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
52	SK	4514-0.5*0.4*0.4CM, 4516-0.8*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
53	SS	0.8*0.5*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
54	RS	1*0.5*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
55	RK	1.5*1*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	DEGENERATED INFLAMMATORY CELLS	N.A	PRESENT	PRESENT	N.A	
56	PS	1*0.8*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
57	RS	0.6*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
58	G	0.5*0.4*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
59	RK	1.2*1*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
60	BR	1*0.5*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
61	HS	1*0.8*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
62	SS	1*0.5*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
63	NK	1.2*1*0.7CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
64	AK	2.8*2*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
65	NS	1*0.5*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
66	SR	2*1.5*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
67	LR	4.5*3*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
68	AS	18*1.6*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
47	VR	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
48	GP	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
49	BS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
50	PS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
51	MG	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
52	SK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA-HIGH GRADE
53	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
54	RS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
55	RK	ABSENT	ABSENT	N.A	ABSENT	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
56	PS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
57	RS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
58	G	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE
59	RK	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
60	BR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA-HIGH GRADE
61	HS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA-HIGH GRADE
62	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA-LOW GRADE
63	NK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
64	AK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
65	NS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
66	SR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
67	LR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
68	AS	PRESENT	PRESENT	>7	ABSENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA-HIGH GRADE WITH SQUAMOID DIFFERENTIATION

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
69	SR	72	F	1535617	7135	N.A	FEROZEPUR	PRESENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY OF URINATION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH 1*0.8CM AT LEFT LATERAL WALL	NO EVIDENCE OF UB CLOTS	YES	1.2 CM
70	IS	65	M	1537920	7190	N.A	JALANDHAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	3*2CM GROWTH AT ANTERIOR WALL	N.A	YES	2 CM
71	SS	85	M	1540074	7414	N.A	KAPURTHALA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH 0.8MM OVER RIGHT LATERAL WALL	N.A	YES	1 CM
72	GK	65	F	1499889	8289	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	GHABRAHAT*8-9DAYS, GENERALISED WEAKNESS*8-9DAYS	HTN	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH OF APPROX 1CM OVER RL WALL OF UB	SOFT TISSUE THICKENING ALONG BASE OF UB ?MALIGNANT	YES	1.5 CM
73	RK	62	F	1545573	8358, 8359	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN*4-5DAYS	HYPOTHYROIDISM	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH APPROX 2.5CM IN LATERAL WALL OF UB	N.A	YES	1.5 CM
74	PS	73	M	1552386	8392	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	DM	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX. 2CM AT LEFT LATERAL WALL	N.A	YES	3 CM
75	MK	56	F	1513591	8383, 8384, 8385	N.A	GURDASPUR	ABSENT	ABSENT	ABSENT	ABSENT	N.A	DM, 23-5431- NON-INV. UROTHELIAL, HIGH GRADE, 7056-INVASIVE, LOW GRADE	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	POLYPODAL GROWTH 2*1CM AT POSTERIOR WALL AND DOME	MULTIPLE POLYPOIDAL LESIONS SEEN IN UB ARISING FROM POSTERIOR AND LATERAL WALL	NO	15cm
76	SR	78	M	1551943	8390	N.A	FEROZEPUR	PRESENT	ABSENT	PRESENT	ABSENT	HEMATURIA, DYSURIA, LUTS	HTN, DM, CAD	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 1CM AT ANTERIOR WALL OF UB	THICKENED UB WALL WITH HYPERDENSE LESIONS ALONG UB WALL	YES	1.5 CM
77	IK	58	F	1556434	8782	N.A	HOSHIARPUR	PRESENT	ABSENT	PRESENT	PRESENT	HEMATURIA, INCREASED FREQUENCY OF MICTURITION, DYSURIA	DM, HTN	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	2.5CM POLYPOIDAL GROWTH AT RIGHT LATERAL WALL OF UB	N.A	YES	2.5 CM
78	AK	53	F	1559910	9007	N.A	HOSHIARPUR	ABSENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN*15DAYS	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH INVOLVING LEFT LATERAL WALL APPROX 1CM	ILL DEFINED LOBULATED SOFT TISSUE MASS ALONG BASE OF UB MEASURIMG 17*12MM	YES	0.8 CM
79	SK	46	M	142086	9075	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	FEVER*1WEEK	HTN, 7733- INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	WALL THICKENING	ILL DEFINED SOFT TISSUE LESION AT RIGHT VUJ WITH MILD RIGHT HYDRONEPHROSIS	YES	0.5 CM
80	LD	58	F	1555426	9083, 9084	960	KANGRA	PRESENT	PRESENT	ABSENT	ABSENT	HEMATURIA*1YEAR, RETENTION OF URINE*1YEAR	DM, HYPOTHYROIDISM	N.A	N.A	N.A	N.A	N.A	ABSENT	POSTERIOR WALL OF UB FULL OF SLOUGH AND NECROTIC MATERIAL	ASYMMETRICAL UB THICKENING	YES	2.2 CM
81	KR	48	M	1562407	9130	N.A	GURDASPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM AT LEFT LATERAL WALL	HETEROGENOUS ENHANCING PLAQUE LIKE THICKENING ALON RIGHT POSTEROLATERAL WALL MEASURING 4.7CM IN LENGTH AND 1.5CM IN THICKNESS	YES	2.5 CM
82	DS	33	M	1562624	9620	N.A	PATIALA	ABSENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY OF MICTURITION	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	YES	0.6 CM
83	KK	67	F	1567122	9699	N.A	LUDHIANA	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	0.6 CM
84	MK	72	F	1318834	9697	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN, PAINLESS HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1ALONG N LEFT F POYPOIDAL	HETEROGENOUSLY ENHANCING POYPOIDAL LESION ALONG POSTERIOR WALL OF UB MEASURING 1.7*1.6CM	YES	2.2 CM
85	KS	46	M	1568696	9737	N.A	JAMMU	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	IRREGULAR WALL THICKENING INVOLVING DOME OF UB MEASURING UPTO 8MM	YES	0.5 CM
86	KS	75	M	1568352	9946	N.A	NAWASHAHER	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	23-9622- INVASIVE UROTHELIAL CARCINOMA, HIGH GRADE	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM AT POSTERIOR WALL	ILL DEFINED HYPODENSE LESION ALONG BASE OF UB MEASURING 5.4*5.2CM	NO	10*9*8CM
87	JS	57	M	1571594	9944	N.A	KAPURTHALA	PRESENT	PRESENT	ABSENT	ABSENT	HEMATURIA, DIFFICULTY IN PASSAGE OF URINE	HTN	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM AT LATERAL AND ANTERIOR WALL	HETEROGENOUS HYPOECHOIC LESION ALONG RL WALL MEASURING 12*10MM AND ON PL WALL AND BASE MEASURING 37*11MM	YES	3.8 CM
88	DK	64	F	1576492	10177	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	0.7 CM
89	SS	55	M	1567437	10204	N.A	FARIDKOT	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM AT ANTERIOR AND POSTERIOR WALL	ILL DEFINED HYPOECHOIC LESION MEASURING 2.3*2.3*1.4CM ALONG RIGHT PL WALL	YES	1.2 CM
90	BS	69	M	1493065	10201	N.A	FEROZEPUR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 1.5*1CM ALONG BASE	MULTIPLE SMALL POLYPOIDAL LESIONS ALONG BASE MEASURING 2.7*2.1CM	YES	3.5 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
69	SR	1.2*0.8*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
70	IS	2*1*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
71	SS	1*0.5*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
72	GK	1.5*1.2*0.8CM	NIL	NIL		N0	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
73	RK	8358-1.5*1.2*0.8CM, 8359-0.4*0.2*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
74	PS	3*2.8*1.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
75	MK	15*12*10cm	NIL	NIL	CYSTECTOMY WITH HYSTERECTOMY	YES	N.A	4 CM	PAPILLARY	FREE	FREE	FREE	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
76	SR	1.5*1*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
77	IK	2.5*1.8*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
78	AK	0.8*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
79	SK	0.5*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS, LYMPHOCYTES, EOSINOPHILS AND PLASMA CELLS	ABSENT	ABSENT	ABSENT	N.A	
80	LD	9083-0.5*0.3*0.1CM, 9084-2.2*2*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
81	KR	2.5*0.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
82	DS	0.6*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS	ABSENT	PRESENT	PRESENT	N.A	
83	KK	0.6*0.4*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL	NEUTROPHILS, LYMPHOCYTES	ABSENT	PRESENT	PRESENT	N.A	
84	MK	2.2*1.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
85	KS	0.5*0.4*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS, LYMPHOCYTES	ABSENT	ABSENT	ABSENT	N.A	
86	KS	10CM	NIL	NIL	RADICAL	YES	AW, PW, RL, LL WALL	7.5*7*2.5CM	PAPILLARY	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	12		N.A	N.A	N.A	N.A	N.A	N.A	
87	JS	3.8*1.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
88	DK	0.7*0.6*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
89	SS	1.2*0.8*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
90	BS	3.5*2.8*1.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
69	SR	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
70	IS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
71	SS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
72	GK	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
73	RK	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
74	PS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GEADE
75	MK	ABSENT	ABSENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	5	N.A	pT1 N0 M0	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE
76	SR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
77	IK	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
78	AK	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
79	SK	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
80	LD	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	FOCAL AREA OF SQUAMOUS DIFFERENTIATION SEEN	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	DONE	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE WITH FOCAL SQUAMOUS DIFFERENTIATION
81	KR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
82	DS	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
83	KK	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
84	MK	ABSENT	ABSENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
85	KS	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
86	KS	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	PRESENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	NOT INVOLVED	N.A	pT3a N0 Mnot applicable	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
87	JS	PRESENT	PRESENT	>7	PRESENT	N.A	N.A	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
88	DK	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
89	SS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
90	BS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE WITH FOCAL HIGH GRADE AREA

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
91	BS	74	M	1209784	10373, 10374, 10375	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	23-9444-NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM AT POSTERIO WALL	MULTIPLE SESSILE AND POLYPOIDAL LESIONS SEEN IN PW, IW AND ALONG LATERAL WALL LARGEST MEASURING 4.9*3.6CM	NO	
92	BS	55	M	1510249	10512	N.A	AMRITSAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ATYPICAL CELLS(CATEGORY-3)	N.A	N.A	YES	0.4 CM
93	RL	57	M	1584189	10758	N.A	JAMMU	ABSENT	PRESENT	ABSENT	ABSENT	DECREASED URINE OUTPUT	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	3.5 CM
94	AS	33	M	1586285	10891	N.A	GURDASPUR	ABSENT	PRESENT	ABSENT	ABSENT	DECREASED URINE OUTPUT	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM ALONG POSTERIOR WALL	POLYPODAL LESION MEASURING 2.3*2.1CM ALONG POSTERIOR WALL OF UB	YES	3.2 CM
95	RR	67	M	1586326	10945, 10964	N.A	GURDASPUR	ABSENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY OF MICTURITION	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 1*1CM AT POSTERIOR WALL	IRREGULAR POLYPOIDAL ENHANCING THICKENING ALONG PW AND RL WALL OF UB, MULTIPLE SESSILE LESIONS	YES	3.2 CM
96	CS	68	M	1588292	11087	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	SUSPICIOUS FOR HGUC (CATEGORY 4)	POLYPOIDAL GROWTH 1*0.5CM AT BASE	N.A	YES	2.3 CM
97	BS	65	M	1587275	11089	N.A	TARAN TARAN	ABSENT	ABSENT	PRESENT	ABSENT	PAIN ABDOMEN, MICTURITION	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH 0.5*0.6CM AT RIGHT LATERAL WALL	INTRALUMINAL MASS MEASURING 1.9*1.3CM ALONG RIGHT PL WALL	YES	1.8 CM
98	SK	56	M	1588366	11185	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	YES	0.8 CM
99	AK	61	M	1588081	11441	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 0.9CM FROM POSTERIOR WALL	WELL DEFINED POLYPOIDAL LESION FROM POSTERIOR WALL OF URINARY BLADDER MEASURING 3.3*2.4*3CM	YES	4.5 CM
100	RK	34	F	1590361	11234	N.A	MOHALI	ABSENT	PRESENT	ABSENT	ABSENT	OVERFLOW INCONTINENCE, DECREASED URINE OUTPUT	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	OVERDISTENDED URINARY BLADDER WITH UPSTREAM BILATERAL HYDROURETERONEPHROSIS	YES	0.8 CM
101	GD	70	M	1586535	11524	N.A	PATHANKOT	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2.6*1.2CM ALONG RIGHT LATERAL WALL	NODULAR POLYPOIDAL LESION 2.6*1.2CM ALONG RIGHT LATERAL WALL OF URINARY BLADDER	YES	1.5 CM
102	H	59	M	1329416	13626, 13627	N.A	UNA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH 1 CM AT LEFT LATERAL WALL	HETEROGENOUSLY ENHANCING MASS ARISING FROM LEFT LATERAL WALL	YES	7.2 CM
103	SS	61	M	1622384	13675, 13676	N.A	HOSHIARPUR	PRESENT	PRESENT	ABSENT	ABSENT	HEMATURIA, UNABLE TO PASS URINE, BILATERAL LOWER LIMB SWELLING	DM, CHRONIC LIVER DISEASE	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	YES	2.1 CM
104	MS	58	M	1280142	13905	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	23-4555- NON-INVASIVE UROTHELIAL CARCINOMA, LOW GRADE	DM, SMOKER	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM AT DOME	HETEROGENOUSLY ENHANCING POLYPOIDAL MASS LESION FROM DOME MEASURING 3.4*2.5CM	YES	1.8 CM
105	VG	47	F	1590731	14228, 14229	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM AT LEFT LATERAL WALL AND DOME	N.A	YES	2.4 CM
106	PS	43	M	1626107	14356, 14357	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH 1CM AT ANTERIOR WALL	N.A	YES	1.5 CM
107	NK	61	M	1631105	14359, 14360	N.A	AMRITSAR	PRESENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN, PAINLESS HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	POLYPOIDAL GROWTHS IN RIGHT LATERAL WALL	3 POLYPOIDAL LESIONS INTO LUMEN, RL AND POSTERIOR WALL	YES	2.5 CM
108	ML	72	M	1489982	14428	N.A	JAMMU	ABSENT	ABSENT	PRESENT	PRESENT	PAINFUL MICTURITION, INCREASED FRQUENCY	23-12314- INFILTRATING PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE	N.A	N.A	N.A	N.A	N.A	SUSPICIOUS FOR HGUC(CATEGORY-4)	GROWTH APPROX 2*1CM AT ANTERIOR WALL	HETEROGENOUSLY ENHANCING MASS LIKE SOFT TISSUE THICKENING ALONG ANTEROR WALL	NO	14CM
109	MS	45	F	1513462	14579	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	23-5273- NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	MULTIPLE GROWTHS PRESENT AT LEFT LATERAL WALL AND BASE LARGEST 2 CM	N.A	YES	1.5 CM
110	ML	67	M	754713	14618	N.A	KANGRA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	3.1*1.1CM SOFT TISSUE GROWTH ARISING FROM BASE OF BLADDER	YES	1.5 CM
111	DS	75	M	1020918	14722	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1LESION AT LEFT NOUSLY HYPOECHOIC POLYPOIDAL LESION ALONG RIGHT PL WALL HYPOECHOIC	HETEROGENOUSLY HYPOECHOIC POLYPOIDAL LESION ALONG RIGHT PL WALL OF UB	YES	0.8 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
91	BS				RADICAL	YES	AW,PW,RL,LL, DOME	5*3*2.8CM	PAPILLARY	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
92	BS	0.4*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
93	RL	3.5*3*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
94	AS	3.2*1.8*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
95	RR	10945-3.2*2.8*0.4CM, 10964-1.5*0.8*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
96	CS	2.3*1.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
97	BS	1.8*0.8*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
98	SK	0.8*0.2*0.1cm	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
99	AK	4.5*2.5*2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
100	RK	0.8*0.5*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL	N.A	ABSENT	ABSENT	ABSENT	N.A	
101	GD	1.5*1*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
102	H	13626-7.2*6*4.8CM, 13627-1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
103	SS	13675-2.1*1*0.8CM, 13676-0.6*0.4*0.3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
104	MS	1.8*1*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
105	VG	2.4*1.5*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
106	PS	14356-1.5*0.6*0.4CM, 14357-1.2*0.7*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
107	NK	14359-2.5*1.7*0.8CM, 14360-0.9*0.6*03CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
108	ML	14*9.5*7.8CM	NIL	NIL	RADICAL	YES	RL, AW AND DOME	2*2*1CM	ULCEROPROLIFERATIVE	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	13		N.A	N.A	N.A	N.A	N.A	N.A	
109	MS	1.5*1*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
110	ML	1.5*1*0.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
111	DS	0.8*0.6*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
91	BS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
92	BS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
93	RL	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
94	AS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
95	RR	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
96	CS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
97	BS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
98	SK	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
99	AK	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
100	RK	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	HAEMORRHAGIC CYSTITIS
101	GD	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
102	H	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
103	SS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
104	MS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
105	VG	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, LOW GRADE
106	PS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE
107	NK	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
108	ML	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	ULCERATION WITH DENSE I.G	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	13	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE WITH FOCAL GLANDULAR DIFFERENTIATION
109	MS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
110	ML	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
111	DS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	PRESENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE

S. NO.	NAME	AGE	SEX	MRD NO.	HISTOPATH NO.	IHC NO.	ADDRESS	HEMATURIA	DECREASED URINE OUTPUT	PAINFUL MICTURITION	INCREASED FREQUENCY	HOPI	PAST HISTORY	PERSONAL HISTORY	FAMILY HISTORY	Hb	TLC	Plt	URINE CYTOLOGY	CYSTOSCOPIC FINDINGS	IMAGING STUDIES	SMALL BIOPSY	LARGEST DIMENSION
112	SS	85	M	1449562	14845	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	PAIN ABDOMEN, PAINLESS HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH AT ANTERIOR WALL MEASURING 1CM	POYLPOIDAL LESION FROM AW OF UB MEASURING 8.9*5.6MM	YES	0.8 CM
113	MS	77	M	1567759	9598	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH 0.8CM AT LEFT LATERAL AND ANTERIOR WALL	N.A	YES	N.A
114	MS	68	M	1566171	9736	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 3*2CM AT LEFT LATERAL WALL	ILL DEFINED LESION INVOLVING RL WALL OF UB MEASURING 3.3*2.1CM	YES	2.2 CM
115	L	53	M	1605060	14894, 14900	N.A	AMRITSAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	ALCOHOLIC, BIDI SMOKER	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM IN ANTERIOR WALL	ILL DEFINED ECHOGENIC CONTENT IN LUMEN ALONG LW MEASURING 4.7*4.1*2CM	NO	15CM
116	S	20	F	1631096	15169	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	0.1 CM
117	JS	52	M	647538	15280	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1.8CM AT POSTERIOR WALL	HOMOGENOUSLY ENHANCING POLYPOIDAL GROWTH ALONG PL WALL MEASURING 1.2*1.2CM	YES	1.8 CM
118	NK	61	M	1631105	127	N.A	AMRITSAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA. FEVER	23-14359, 14360- INVASIVE UROTHELIAL CARCINOMA, HIGH GRADE	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	3 POLYPOIDAL SOFT TISSUE LESIONS ALONG RL AND PW, LARGEST MEASURING 2.1*1.6CM	YES	0.2 CM
119	BS	57	M	1645628	257	N.A	MANSA	PRESENT	ABSENT	PRESENT	ABSENT	PAINFUL MICTURITION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*CM FROM DOME	POLUPOIDAL MASS LESIONS WITH PERIPHERAL CALCIFICATION FROM DOME OF UB MEASURING 2.5*1.8 AND 1.5*0.9CM	YES	2.5 CM
120	SS	75	M	1641258	332, 333, 334	N.A	NAWANSHAHR	PRESENT	ABSENT	ABSENT	PRESENT	INCREASED FREQUENCY, HEMATURIA	23-15256, 15257- INVASIVE UROTHELIAL CARCINOMA, HIGH GRADE	N.A	N.A	N.A	N.A	N.A	HGUC(CATEGORY-5)	GROWTH APPROX 2*1 AT ANTERIOR AND RIGHT LATERAL WALL	ASYMMETRIC HETEROGENOUSLY ENHANCING ULCEROPROLIFERATIVE GROWTH INVOLVING LEFT AL WALL MEASURING 6*3CM	NO	13CM
121	MS	63	M	1625510	369	88	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1MEASURING AT LEFT LATERAL WALL	POLYPOIDAL THICKENING MEASURING APPROX. 1.5*1.4CM INVOVING RIGHT PL WALL	NO	13CM
122	SK	58	F	1654979	691, 692	N.A	KAPURTHALA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	POLYPOIDAL SOFT TISSUE LESION ALONG RIGHT PL WALL?MALIGNANT ?CYSTITIS	YES	1.2 CM
123	PS	75	M	1598066	709	N.A	JALANDHAR	ABSENT	ABSENT	ABSENT	ABSENT	N.A	23-11895, 11896- NON INVASIVE PAPILLARY UROTHELIAL CARCINOMA ,LOW GRADE	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	POLYPOIDAL GROWTH 1*1CM AT RIGHT AND LEFT LATERAL WALL	NODULAR SOFT TISSUE MASS ALONG LEFT PL WALL INFILTRATING INTO VESICOURETERIC JUNCTION	YES	1.6 CM
124	AS	72	M	1647569	1099	N.A	LUDHIANA	PRESENT	ABSENT	PRESENT	ABSENT	PAINFUL MICTURITION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM IN ANTERIOR WALL	POLYPOIDAL PROJECTION MEASURING 1.7*1.7CM FROM RL WALL INTO LUMEN	YES	1.8 CM
125	PS	49	M	1245921	1102	N.A	JALANDHAR	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	YES	0.3 CM
126	HS	53	M	1525874	1106	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA. FEVER	23-6374, 11085- NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE	N.A	N.A	N.A	N.A	N.A	HIGH GRADE UROTHELIAL CARCINOMA(CATEGORY 5)	GROWTH APPROX 2*1AND AT LEFT ESIONS ALONG RL AND PW MEASURING 7.3MM AND 3.5MM RESPECTIVELY	2 POLYPOIDAL LESIONS ALONG RL AND PW MEASURING 7.3MM AND 3.5MM RESPECTIVELY	YES	0.6 CM
127	RN	87	M	1660593	1176	N.A	LUDHIANA	ABSENT	PRESENT	ABSENT	ABSENT	DECREASED URINE OUTPUT, ALTERED SENSORIUM	N.A	PROSTATOMEGALY*6YEARS	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM AT LEFT LATERAL WALL	IRREGULAR PLAQUE LIKE THICKENING 3.7*1.8CM ALONG LL WALL OF UB	YES	5.2 CM
128	AK	72	M	1664633	1290	N.A	JAMMU	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	GROWTH APPROX 2*1CM INVOLVING RIGHT PW	4 POLYPOIDAL SOFT TISSUE LESIONS INVOLVING RIGHT PL, RL WALL MEASURING 4.7*2.4MM	YES	5 CM
129	BC	62	M	1662579	1338	N.A	YAMUNANAGAR	PRESENT	ABSENT	PRESENT	ABSENT	PAINFUL MICTURITION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	LARGE HYPODENSE FOCUS ALONG RIGHT PL WALL OF UB MEASURING 2.1*1.2CM	YES	0.2 CM
130	KL	74	M	1589094	1514	N.A	JALANDHAR	PRESENT	ABSENT	PRESENT	ABSENT	PAINFUL MICTURITION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	GROWTH APPROX 2*1CM AT LEFT LATERAL WALL	N.A	YES	1.8 CM
131	D	73	M	1669796	1787	N.A	LUDHIANA	PRESENT	ABSENT	ABSENT	ABSENT	HEMATURIA. COUGH, FEVER, SHORTNESS OF BREATH	N.A	HTN, AKI	N.A	N.A	N.A	N.A	ABSENT	N.A	PROVISIONAL DIAGNOSIS OF CA PROSTATE, BLADDER CLOTS	YES	5.2 CM
132	PC	57	M	1676211	2036	N.A	LUDHIANA	PRESENT	ABSENT	PRESENT	ABSENT	PAINFUL MICTURITION, HEMATURIA	N.A	N.A	N.A	N.A	N.A	N.A	NEGATIVE(CATEGORY-2)	N.A	N.A	YES	4 CM

S. NO.	NAME	DIMENSIONS	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	TYPE OF CYSTECTOMY	CYSTECTOMY	SITE OF GROWTH	SIZE	GROWTH CONFIGURATION	URETERIC MARGINS	SOFT TISSUE MARGINS	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	NUMBER OF LYMPH NODES	HISTOPATHOLOGY OF NON-NEOPLASTIC LESIONS	EPITHELIUM	LAMINA PROPRIA INFILTRATION	GRANULOMA	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	SPECIAL STAINS	HISTOPATHOLOGY OF NEOPLASTIC LESIONS
112	SS	0.8*0.6*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
113	MS	OUTSIDE BLOCK	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
114	MS	2.2*1.8*1.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
115	L	15*11*6CM	NIL	NIL	RADICAL	YES	TRIGONE	3.5*1.8*0.9CM	ULCEROPROLIFERATIVE	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
116	S	0.1*0.1*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		NORMAL	LYMPHOCYTES AND EOSINOPHILS	ABSENT	ABSENT	ABSENT	PAS NEGATIVE	
117	JS	1.8*1.8*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
118	NK	0.2*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS, LYMPHOCYTES AND LYMPHOID AGGREGATES	ABSENT	ABSENT	ABSENT	N.A	
119	BS	2.5*1.8*1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
120	SS	13*10*6.5CM	NIL	NIL	RADICAL	YES	RL, LL, AW AND DOME	3.2*2.5*2CM	PAPILLARY	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	15		N.A	N.A	N.A	N.A	N.A	N.A	
121	MS	13*9*5CM	NIL	NIL	RADICAL	YES	RL, ANTERIOR WALL	2*1.6*1CM	PAPILLARY	NOT INVOLVED	NOT INVOLVED	ABSENT	ABSENT	ABSENT	13		N.A	N.A	N.A	N.A	N.A	N.A	
122	SK	691-1.2*0.7*0.4CM, 692-0.4*0.3*0.2CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		EROSION	NEUTROPHILS, LYMPHOCYTES AND PROMINENCE OF EOSINOPHILS	ABSENT	PRESENT	PRESENT	PAS NEGATIVE	
123	PS	1.6*0.6*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
124	AS	1.8*1*0.7CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
125	PS	0.3*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS, LYMPHOCYTES	ABSENT	PRESENT	PRESENT	PAS NEGATIVE	
126	HS	0.6*0.5*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
127	RN	5.2*2.5*0.5CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
128	AK	5*4*3CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
129	BC	0.2*0.2*0.1CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		ULCERATED	NEUTROPHILS,LYMPHOCYTES, PROMINENCE OF EOSINOPHILS	ABSENT	PRESENT	PRESENT	PAS NEGATIVE	
130	KL	1.8*1*0.8CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
131	D	5.2*3.8*0.4CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	
132	PC	4*2.8*1.6CM	NIL	NIL		NO	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A		N.A	N.A	N.A	N.A	N.A	N.A	

S. NO.	NAME	PAPILLAE	FUSION OF PAPILLAE	NO. OF LAYERS	UMBRELLA CELLS	LOSS OF POLARITY	MITOSIS	LINING EPITHELIUM	AREAS OF HAEMORRHAGE	AREAS OF NECROSIS	ANY ASSOCIATED LESIONS	INVASION INTO LAMINA PROPRIA	MUSCULARIS PROPRIA	INVASION INTO MUSCULARIS PROPRIA	INVOLVEMENT OF RESECTED MARGINS	LVI	PNI	INVASION INTO PROSTATE	INVASION INTO SEMINAL VESICLES	INVASION INTO EJACULATORY DUCT	LN	IHC	TNM STAGE	FINAL HISTOPATHOLOGICAL DIAGNOSIS
112	SS	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
113	MS	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA POSSIBLY PLASMACYTOID UROTHELIAL CARCINOMA
114	MS	PRESENT	PRESENT	>7	PRESENT	PRESENT	ABSENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
115	L	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	PRESENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	pT4 Nn.a Mn.a	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
116	S	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
117	JS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
118	NK	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
119	BS	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
120	SS	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	15	N.A	pT3 N0 Mnot applicable	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
121	MS	ABSENT	ABSENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	13	N.A	pT2 N2 Mnot applicable	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
122	SK	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	EOSINOPHILIC CYSTITIS
123	PS	ABSENT	ABSENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE WITH INFILTRATION INTO PROSTATE
124	AS	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
125	PS	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ULCER
126	HS	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
127	RN	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
128	AK	PRESENT	PRESENT	N.A	ABSENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	INFILTRATING UROTHELIAL CARCINOMA, HIGH GRADE
129	BC	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	CHRONIC CYSTITIS
130	KL	PRESENT	PRESENT	>7	PRESENT	PRESENT	PRESENT	N.A	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, LOW GRADE
131	D	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	BLOOD CLOT ONLY
132	PC	PRESENT	PRESENT	>7	ABSENT	PRESENT	PRESENT	N.A	N.A	N.A	ABSENT	ABSENT	ABSENT	ABSENT	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A	NON-INVASIVE PAPILLARY UROTHELIAL CARCINOMA, HIGH GRADE

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The Principal
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Subject:: Approval of Plan of Thesis.

This is to inform you that the Faculty of Medical Sciences in its meeting held on 25.09.2023 has approved the plan of thesis of **Pragya Sharma**, a student of your college for **MD Pathology** along with the names of Supervisor/Co-Supervisor as under:-

Topic Plan of Thesis
Histopathological spectrum of urinary bladder biopsies .

Supervisor
Dr. Harpreet Kaur
Prof. & Head
Dept. of Pathology

Co-Supervisor:-
Dr. Aminder Singh
Assoc. Prof.,
Dept. of Pathology

Co-Supervisor:-
Dr. Sandeep Sharma
Prof. & Head
Dept. of Urology

The student may submit the thesis in triplicate alongwith the plan in triplicate also, to the Controller of Examinations, BFUHS, Faridkot, at least six months before the commencement of theory examination, if he/she is otherwise eligible to take the examination. He /She may be directed to attach a photocopy of this letter with the forwarding letter while submitting thesis in the University along with the letter of approval of University for change of supervisor/Co-Supervisor, change of topic, if any.

Controller of Examinations

Note :

1. *If any discrepancy found regarding topic of thesis or Supervisor/Co-Supervisor, inform undersigned within one month after issue of this letter.*

HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES

THESIS PROPOSAL

FOR APPROVAL OF SUBJECT OF THESIS TO BE SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

MD

In

PATHOLOGY

OF THE

BABA FARID UNIVERSITY OF HEALTH SCIENCES

FARIDKOT

AUGUST, 2022

DR. PRAGYA SHARMA

DEPARTMENT OF PATHOLOGY
DAYANAND MEDICAL COLLEGE AND HOSPITAL
LUDHIANA

ABSTRACT OF PLAN OF THESIS

Title	HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES
For the degree of	MD (PATHOLOGY)
Name of the candidate	Dr. Pragya Sharma
Supervisor	Dr.Harpreet Kaur, Professor and Head , Department of Pathology, DMCH, Ludhiana
Co-supervisor(s)	Dr. Aminder Singh, Associate Professor, Pathology, DMCH, Ludhiana Dr. Sandeep Sharma, Professor & Head, Urology, DMCH, Ludhiana
Institution	Dayanand Medical College and Hospital, Ludhiana
University	Baba Farid University of Health Sciences, Faridkot

Introduction: All urinary bladder biopsies and specimens will be analysed to study vast histomorphological spectrum of lesions.

Aims & Objectives: To study the histomorphological spectrum of urinary bladder lesions

Material & Methods: This will be a one year prospective study from 15th September, 2022 to 14th March 2024 and will be conducted in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana. All superficial biopsies, deep muscle biopsies of urinary bladder, and cystectomy specimens received in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana will be included in the study. Slides will be subjected to IHC examination whenever possible under both low power (100x) and high power (400x).

Clinical Significance: To obtain a good database for accuracy of the diagnosis of histopathology of urinary bladder biopsies.

Keywords:

Pragya Sharma

(Signature)	(Signature)	(Signature)	(Signature)	(Signature)
Candidate	Co-supervisor	Co-supervisor	Supervisor	Principal

CERTIFICATE OF FACILITIES AVAILABLE

This is to certify that the facilities for work on the subject of thesis titled **"HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES"** exist in the Department of Pathology, DMC&H, Ludhiana and will be provided to the candidate. We will see that the data being included in the thesis is genuine and is collected by the candidate herself under our supervision and guidance.

Supervisor

Dr. Harpreet Kaur
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Department of Pathology
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Co-Supervisor's

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Head of the Department

Dr. Harpreet Kaur
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Place : LUDHIANA
Date : _____

APPROVAL PROFORMA
BY RESEARCH & ETHICAL COMMITTEE
DAYANAND MEDICAL COLLEGE & HOSPITAL, LUDHIANA

Name of candidate	Dr. Pragya Sharma
Department	Pathology
Topic of Thesis	HISTOPATHOLOGICAL SPECTRUM OF URINARY BLADDER BIOPSIES
Likely date of appearing in PG examination	May/June, 2024
Date of enrollment	7th March, 2020
Name of Head of Department	Dr. Harpreet Kaur
1) Supervisor **2) Co-Supervisor(s)**	Dr. Harpreet Kaur Dr. Aminder Singh Dr. Sandeep Sharma
Signature of Members of Research Committee with Stamp	**Signature of Members of Ethics Committee with Stamp**
Dr. Harpreet Kaur (Professor & Head, Pathology)	Mr. R K Sharma (Legal Expert)
Dr. Jaspal Singh (Professor & Head, Surgery)	Dr. Ramit Mahajan (Associate Professor, Gastroenterology)
Dr. Dinesh Gupta (Professor & Head, Medicine)	Dr. Anu Sharma (Professor, Anatomy)
Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)	Dr. Sandeep Kaushal (Dean Academics & Professor & Head, Pharmacology)
Dr. Gurpreet S Wander (Vice Principal)	Dr. Gurpreet S Wander (Vice Principal & Professor & Head, Cardiology)
	Dr. Gagandeep Singh (Secretary, Ethics Committee Professor & Head, Neurology)

Approved: Yes / ~~No~~

Dr. Sandeep Puri
Chairperson
Research Committee

Chairperson
Research Committee

Approved: Yes / ~~No~~

Prof. Arvind Malhotra
Chairperson
Ethics Committee

Chairperson
Ethics Committee

BABA FARID UNIVERSITY OF HEALTH SCIENCES, FARIDKOT

PROFORMA FOR REGISTRATION OF SUBJECT FOR DISSERTATION

1	NAME OF THE CANDIDATE AND ADDRESS	Dr. Pragya Sharma
2	NAME OF THE INSTITUTE	Dayanand Medical College and Hospital, Ludhiana
3	COURSE OF STUDY AND SUBJECT	MD Pathology
4	DATE OF ADMISSION OF COURSE	07-03-2022
5	TITLE OF THE TOPIC	Histopathological Spectrum of Urinary Bladder Biopsies

6. BRIEF RESUME OF THE INTENDED WORK

6.1 NEED FOR THE STUDY

Lesions of the urinary bladder with gland like or true glandular differentiation can present a significant source of differential diagnostic complexity as they range from benign reactive conditions to aggressive malignant neoplasms both primary and secondary. Lesions with minimal evidence of premalignant potential includes several proliferative and reactive processes such as cystitis cystica and cystitis glandularis, although the possibilty exists for confusion of such lesions with an infiltrative neoplasm, particularly in limited biopsy specimens. Similarly ectopic tissues of Mullerian origin may be seen occasionally in the urinary bladder and their differentiation from a true glandular neoplasm is important to avoid improper treatment.(1)

A wide spectrum of morphological variants exist with varying degrees of glandular differentiation. Several benign proliferative processes may occur in the urinary bladder possessing either true glandular differentiation or gland like cystic elements.(1)

The urinary bladder lesions can be divided into non-neoplastic and neoplastic conditions. The non-neoplastic conditions include cystitis glandularis, interstitial cystitis, eosinophilic cystitis, emphysematous cystitis, tuberculosis and bacillus calmette guerin induced granulomas, malakoplakia, haemorrhagic cystitis, giant cell cystitis, follicular cystitis and cystitis secondary to ketamine administration.

Metaplastic and tumor like conditions include intestinal metaplasia and cystitis glandularis, nephrogenic metaplasia, polypoid cystitis, prostatic like polyps, fibroepithelial polyps and pseudocarcinomatous proliferation.(2)

Neoplastic conditions include papillary carcinomas, papillary neoplasm of low malignant potential, low grade papillary carcinoma, high grade papillary carcinoma, inverted papilloma, squamous cell carcinoma, adenocarcinoma, small cell and large cell neuroendocrine carcinoma, leiomyoma, lymphoma, solitary fibrous tumour, paraganglioma. Present study is being undertaken in view of the vast spectrum of lesions occurring in urinary bladder.(2)

6.2 REVIEW OF LITERATURE

The urinary bladder is a hollow viscous with the shape of a four sided inverted pyramid when empty and of a rounded structure when distended .It has- superior surface (also known as dome), posterior surface (also known as base) and the two inferolateral surfaces.[3] The trigone is located at the base of the bladder and is continuous with the bladder neck to open into the urethra.

The urinary bladder has a thick muscular wall. It has the following layers-

Lining epithelium, lamina propria, muscularis propria and serosa. The mucosa is formed by the epithelium and lamina propria, which often contains a continuous or discontinuous muscularis mucosae. The epithelium of the bladder has been referred to as transitional, but the preferred term urothelium is more informative and accurate. It is generally six to seven cells thick in the contracted bladder, but only two or three cells thick in the distended bladder. It has three layers: superficial, intermediate, and basal. The superficial layer is made up of large cells having abundant eosinophilic cytoplasm and referred to as umbrella cells. The umbrella cells may also have large multilobated nuclei and prominent cytoplasmic vacuolization. The intermediate cells have a cuboidal to low columnar shape, oval nuclei with fine chromatin and frequent nuclear grooves, moderately abundant cytoplasm and well-defined margins. The basal layer is made up of a row of cuboidal cells that lie on a thin continuous basal lamina.

The lamina propria is composed of loose connective tissue containing a rich vascular network, lymph vessels, and a few elastic fibers. A rather prominent collection of arteries and veins is present in the midportion of the lamina propria and divides this layer into an inner and an outer zone. Smooth muscle cells are also present in the lamina propria, usually as isolated bundles, sometimes as a discontinuous thin layer, and rarely as a continuous layer.[2] In the wall are found three loosely arranged layers of smooth muscle - the inner longitudinal, middle circular and the outer longitudinal layers. The three layers are

arranged in anastomosing smooth- muscle bundles between which is found the interstitial connective tissue.

The interstitial connective tissue merges with the connective tissue of the serosa.

Mesothelium covers the connective tissue of the serosa and is the outermost layer. Mucosa of an empty bladder exhibits numerous mucosal folds that disappear during bladder distension. Transitional epithelium also called Urothelium is found only within the conducting passages of the urinary bladder for which it is especially adapted.

Cystitis

Interstitial cystitis-The classic clinical description of interstitial (Hunner) cystitis (or painful bladder syndrome) is that of an adult or elderly female with ulceration and marked submucosal edema of the bladder resulting in prominent pain.[4] Microscopically there is mucosal ulceration covered by fibrin and necrotic material.[5]

Eosinophilic cystitis-Clinically the allergic associated form of eosinophilic cystitis presents with recurrent episodes of dysuria and hematuria.[6] The cystoscopic appearance is that of a diffusely edematous and erythematous mucosa with broad based polypoidal growths that may simulate a neoplastic process.[7] Microscopically, a dense inflammatory infiltrate rich in eosinophils often accompanied by fibrosis and muscle necrosis and sometimes by giant cells is present.[8]

Emphysematous cystitis-Emphysematous cystitis (cystitis emphysematosa) is an inflammatory condition caused by gas-forming bacteria (such as Clostridium perfringens) and characterized by the presence of gas-filled vesicles in the bladder wall.[9] Patients with diabetes, neurogenic bladder, chronic urinary infection, and malignant hematologic conditions are pre-disposed to the disease.[10]

Tuberculosis and Bacillus Calmette Guerin induced granulomas-Intravesical administration of bacillus Calmette–Guérin (BCG), as used for the treatment of superficial carcinoma of the bladder, can result in granulomatous inflammation of this organ, which may be detected microscopically or on cytologic examination of bladder.[11]

Malakoplakia-Malakoplakia of the bladder is characterized by the appearance of multiple nodular thickenings of the mucosa and underlying stroma, usually in the region of the trigone, which may be mistaken for carcinoma.[12] Microscopically, collections of histiocytes with granular eosinophilic cytoplasm accumulate beneath the surface epithelium. In some of these cells, rounded, concentrically layered intracytoplasmic inclusions known as Michaelis–Gutmann bodies are seen.[13]

Other types of cystitis includes Haemorrhagic cystitis, Giant cell cystitis, Follicular cystitis and cystitis secondary to ketamine administration.

Metaplastic and tumor like conditions of urinary bladder include, Intestinal metaplasia and cystitis glandularis , nephrogenic metaplasia, polypoid cystitis, prostatic like polyps, fibroepithelial polyps and pseudocarcinomatous proliferation

Urothelial carcinomas can be classified into different categories.Low grade papillary urothelial carcinomas usually do not invade the bladder wall but recur locally. In contrast high grade non papillary urothelial carcinomas are more likely to invade into the bladder wall and to metastasize resulting in significantly higher mortality.[14] As these bladder tumors represent a heterogeneous group with different subtypes and behavioral patterns. These neoplasms pose biological, clinical, diagnostic and therapeutic challenges to both urologist and pathologist.[15]

The risk factors for transitional cell carcinoma includes tobacco smoke, occupational exposures to heavy metals like arsenic[16], chronic urinary tract infections. Cyclophosphamide, an alkylating agent used in the treatment of malignant neoplasms particularly lymphoproliferative and myeloproliferative disorders increases the risk of bladder cancer.[17] Radiotherapy is a risk factor for bladder cancer [18] and infections by Schistosoma hematobium leads to development of squamous cell carcinoma of urinary bladder.[19-21]

WHO Classification of tumors of the urinary tract (year 2016)[22].

1) Infiltrating urothelial carcinoma

2) Non invasive urothelial lesion

a) Urothelial carcinoma in situ

b) Non invasive papillary urothelial carcinoma

c) Papillary urothelial neoplasms of low malignant potential

d) Urothelial papilloma

e) Inverted urothelial papilloma

f) Urothelial proliferation of uncertain malignant potential

g) Urothelial dysplasia

3) Squamous cell neoplasms

a) Pure squamous cell carcinoma

b) Verrucous carcinoma

c) Squamous cell papilloma

4) Glandular neoplasms

a) Adenocarcinoma

b) Villous adenoma

5) Urachal carcinoma

6) Tumours of mullerian type

7) Neuroendocrine tumours

a) Small cell neuroendocrine carcinoma

b) Large cell neuroendocrine carcinoma

c) Well differentiated neuroendocrine tumour

d) Paraganglioma

8) Melanocytic tumors

a) Malignant melanoma

b) Naevus

c) Melanosis

9) Mesenchymal tumours

a) Rhabdomyosarcoma

b) Leiomyosarcoma

c) Angiosarcoma

d)Inflammatory myofibroblastic tumour

e) Perivascular epithelioid cell tumour

f) Solitary fibrous tumour

g) Leiomyoma

h) Hemangioma

i) Granular cell tumour

j) Neurofibroma

10) Hematopoietic and lymphoid tumors

a) Lymphoma

b) Plasmacytoma

11)Miscellaneous tumors

a) Carcinoma of Skene,Cowper and Littre glands

b) Epithelial tumors of the upper urinary tract

c) Epithelial tumors arising in a bladder diverticulum

d) Urothelial tumors of the urethra

Immunohistochemical features-The neoplastic cells of urothelial carcinoma typically express CK7, CK20, p63 and high molecular weight cytokeratin. GATA3 shows nuclear staining in urothelial carcinoma.

According to a prospective study done at ACPM Medical College, Maharashtra by Dravid NV, Rajeshwari K, Kari Basappa GN et al in 2016 for a period of three years ,out of 139 cystoscopy biopsies, the non-neoplastic bladder lesions constituted 26.6% and neoplastic lesions constituted 73.38%. Among the neoplastic, benign lesions showed 10.79% of the cases and malignant lesions showed 62.58% of the cases. Among the malignant lesions urothelial carcinoma was the commonest accounting for 55.39% of cases with increased prevalence of high grade papillary urothelial carcinoma and invasive papillary urothelial carcinoma accounting for 78.25% of the cases.[23]

A retrospective study was done by C. Aparna et al over a period of 3 years in June 2016 pulblished in International Journal by the Department of pathology Guntur medical College. Total cases were 38

among which 31.5% were non-neoplastic lesions and 68.5% were neoplastic lesions. Of the neoplastic lesions 84.6% were urothelial carcinomas of varying grade and 15.4% were squamous cell carcinomas. The male to female ratio was 5:1.The commonest age group was seen in the 41 to 60 years .Out of 26 cases, 6 were low-grade and 18 were high-grade neoplasms.[24]

In a retrospective study done in 2017 by Dr Suba J, Dr Gayathri J, Dr Jayaprakash at Department of Pathology, Dr BRAMC ,Bangalore, Karnataka consisted of 70 cases of cystoscopic bladder biopsies.3 specimens out of 70 were inadequate for reporting. Of the remaining 67 cases ,38 were neoplastic, 29 were non-neoplastic. Majority cases were in the age group of 41-50 years with male predominance. Urothelial tumours were predominant lesions under neoplastic category of which invasive papillary urothelial carcinoma was the most common subtype. Among non-neoplastic lesions, chronic non-specific cystitis was the commonest lesion noted.[25]

In study done by Dr Anita Shah et al in the year 2018 for a period of 12 months at Department of pathology, University College Of Medical Sciences Nepal, among the 36 cases studied, majority urinary bladder lesions were in age group 61-70 years. The patients had a combination of lower urinary tract symptoms the commonest being hematuria. 30.55% had non-neoplastic lesions and 69.55% had neoplastic lesions. Among non neoplastic cases, 5.55% had chronic granulomatous inflammation. Most common neoplastic lesion was infiltrating urothelial carcinoma followed by non-invasive urothelial neoplasm.[26]

A study done in 2019 by Dr K Papa Ratnam, Dr S Jagadeeswari, Dr S Krishna Kumari which appeared in International Journal of Scientific Research Volume 8; Issue-11 ,November 2019. Out of the 54 biopsies received,12 were non-neoplastic, and 40 were neoplastic cases .Majority of the cases were in 60-79 years age group. Males were

affected more than females. Majority of the neoplastic lesions were urothelial carcinomas.[27]

In another retrospective study done by S Preethamol, PS Prasanth et al at a tertiary care centre in Kerala over a period of 6 months in year 2020, a total of 742 lesions were histologically evaluated out of which a total of 688 cases were neoplastic, 46 cases were diagnosed as non-neoplastic and 8 cases were metastatic malignancy. A total of 646 cases were males .Most affected age group was 61 to 80 years. Hematuria was the most common clinical presentation.[28]

In a retrospective as well as prospective study done at LN medical College Bhopal by Arunika Lekhi et al in 2021 for one and a half year a total of 100 lesions were submitted for histopathological examination .90% of them were neoplastic rest 10% were diagnosed as cystitis. 84% of them were males, one third of them were found to be in age group of 61 to 70 years which is found to be the commonest age group. Two thirds of the cases were high-grade urothelial carcinoma.[29]

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6.3 AIMS AND OBJECTIVES OF THE STUDY

1. To study the histomorphological spectrum of urinary bladder biopsies.
2. To correlate the morphology with IHC findings whenever possible.

7. MATERIALS AND METHODS

All superficial biopsies, deep muscle biopsies of urinary bladder and cystectomy specimens received in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana will be included in the study. Slides will be subjected to IHC examination whenever possible.

7.1 Source of Data

This will be a 1.5 year prospective study from 15th September 2022 to 14th March 2024 and will be conducted in the Department of Pathology, Dayanand Medical College and Hospital, Ludhiana.

7.2 METHOD OF COLLECTION OF DATA

INCLUSION CRITERIA

All urinary bladder biopsies and cystectomy specimens received in the Pathology department

EXCLUSION CRITERIA-

- All other histopathological specimens.

Methodology:

All the urinary bladder biopsies and cystectomy specimens received in the Department of Pathology will be fixed in 10% neutral buffered formalin for 24 hours before the tissue will be processed for paraffin blocking. Multiple sections of 3-5um thickness will be taken and stained with regular Haematoxylin and Eosin stain. IHC will be done wherever required. Patient's history and clinical details will be obtained from histopathological requisition forms.

DURATION OF STUDY

This will be a 1.5 year prospective study from 15th September 2022 to 14th March 2024.

OUTCOME

The vast histomorphological spectrum of urinary bladder biopsies will be analysed.

STATISTICAL ANALYSIS

Data will be described in terms of range; mean +/- standard deviation (+/-SD), frequencies (number of cases) and relative frequencies (percentages). All statistical calculations will be done using SPSS (Statistical Package for The Social Science) SPSS 21 version statistical program for Microsoft Windows.

7.3 DOES THE STUDY REQUIRE ANY INVESTIGATIONS OR INTERVENTIONS TO BE CONDUCTED ON PATIENTS OR OTHER HUMANS OR ANIMALS? IF SO, PLEASE DESCRIBE BRIEFLY.

No.

7.4 HAS ETHICAL CLEARANCE BEEN OBTAINED FROM YOUR INSTITUTION IN CASE OF 7.3?

Attached herewith.

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PROFORMA

S.No.- Age/Sex-

Name- MRD No.-

Histopath No.- IHC No.-

Date of receiving- Date of reporting-

Address-

History of present illness-

Past History-

Personal History-

Family history-

Investigations-Hb- TLC- DLC-

Urine cytology-

Cystoscopic findings-

Imaging studies(CT/MRI)-

Gross Examination –

A) Small Biopsy Specimens

Dimensions –

Cut section –

Signature of Candidate **Signature of Supervisor**

Areas of haemorrhage – Present/Absent

Areas of necrosis - Present/Absent

B) Cystectomy specimen- Partial/ Total/Radical cystectomy/Radical cystoprostatectomy

- Site of growth- Trigone/Right lateral wall/ Left lateral wall/Anterior wall/Posterior wall/Dome/ other if any specify
- Size of growth-
- Growth configuration- Solid/Ulcerated/ Nodule/ Flat/cannot be determined
- Ureteric margins - involved/not involved
- Soft tissue margins- involved/not involved

  If involved specify-
- Invasion into Prostate- present/absent
- Invasion into Seminal vesicles- present/absent
- Invasion into Ejaculatory duct- present/absent
- No. of lymph nodes-

  and if invoved size of largest lymph node-

HISTOPATHOLOGICAL EXAMINATION

Non-neoplastic lesions

Epithelium- Normal/erosion/ulcerated/reactive changes

Lamina propria- infiltration by neutrophils/ lymphocytes/ eosinophils/ lymphoid follicles

Granulomas- Present/Absent

Areas of haemorrhage- Present/Absent

Areas of necrosis- Present/Absent

Special stains-

Neoplastic lesions- Superficial/Deep muscle biopsy/Cystectomy specimen

- Papillae- Present/Absent
- Fusion of papillae- Present/Absent
- No. of layers-
- Umbrella cells- Present/Absent
- Loss of polarity- Present/Absent
- Mitosis- Present/Absent

  If present specify the no.-

  Specify the site(layer)-
- Lining epithelium- Dysplasia- Present/Absent
- Areas of haemorrhage- Present/Absent
- Areas of necrosis- Present/Absent
- Histological type -
- Any associated lesion- Present/Absent

  If present specify-
- Invasion into lamina propria- Present/Absent
- Muscularis propria- Present/Absent
- Invasion into muscularis propria- Present/Absent
- Involvement of resected margins- Present/Absent
- Lymphovascular invasion- Present/Absent
- Perineural invasion- Present/absent
- Invasion into prostate- Present/Absent

- Invasion into seminal vesicles- Present/Absent
- Invasion into ejaculatory duct- Present/Absent
- Lymph nodes- Involved/Not involved

If involved specify the number

IHC – done/not done

TNM staging –

Final histological diagnosis

Signature of Candidate **Signature of Supervisor**